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COUNTDOWN TO

The Year 2000

Will Your Systems Be Ready When The Clock Strikes 12?

PAGE 52

ALSO INSIDE

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PAGE 40

John Jung sounded the alarm at Chubb and Son

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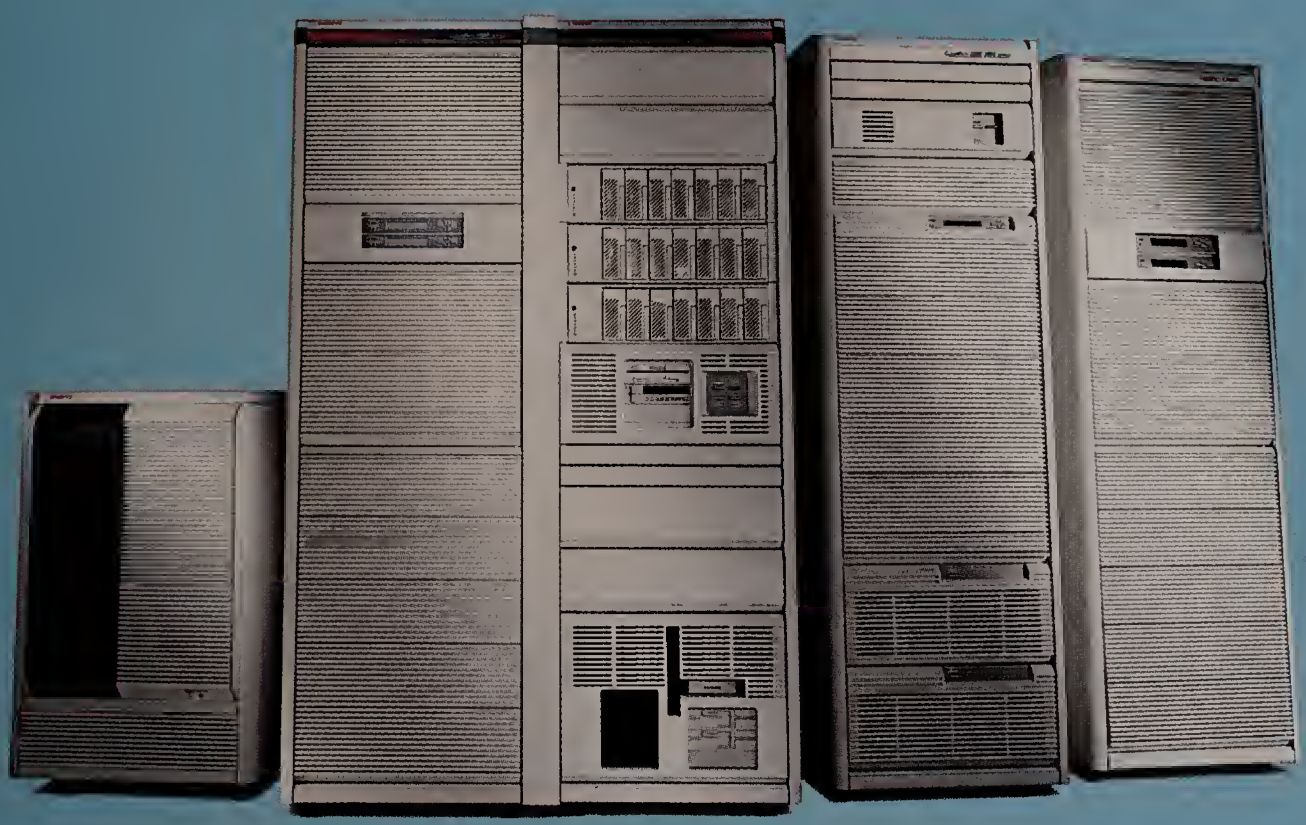

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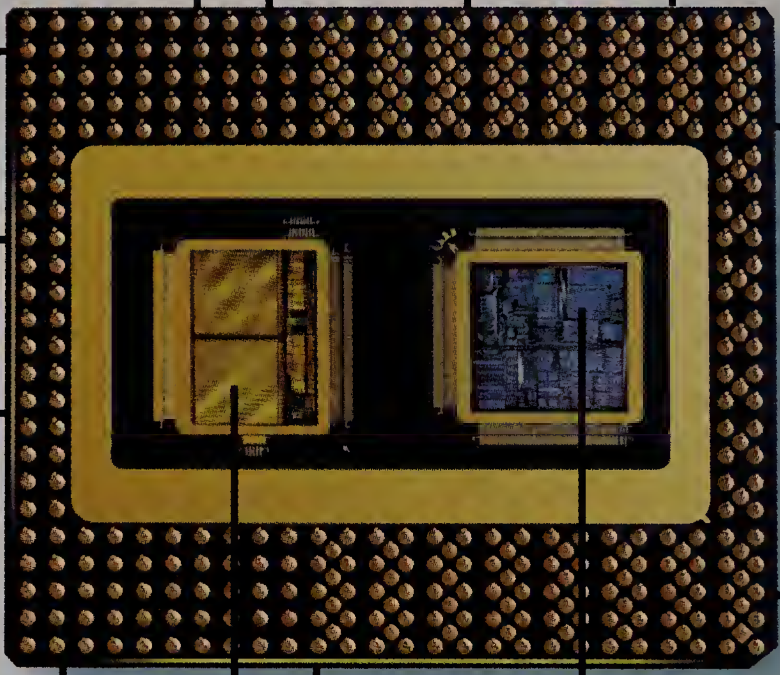

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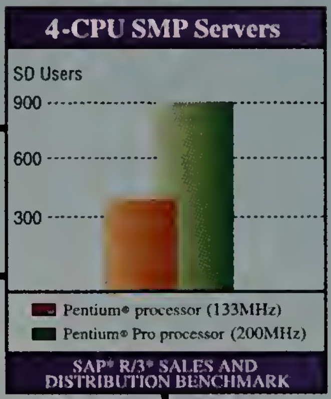

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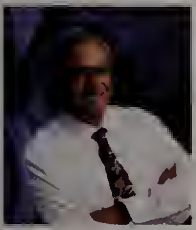
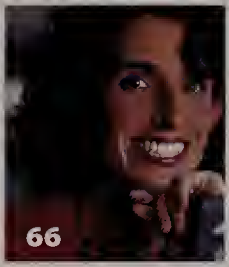


52 *The year 2000 date-conversion issue is a huge challenge for technology executives. Find out how some CIOs, like Chubb and Son's John Jung, are tackling it. Cover photo by John Rae*



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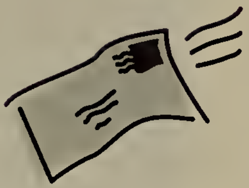

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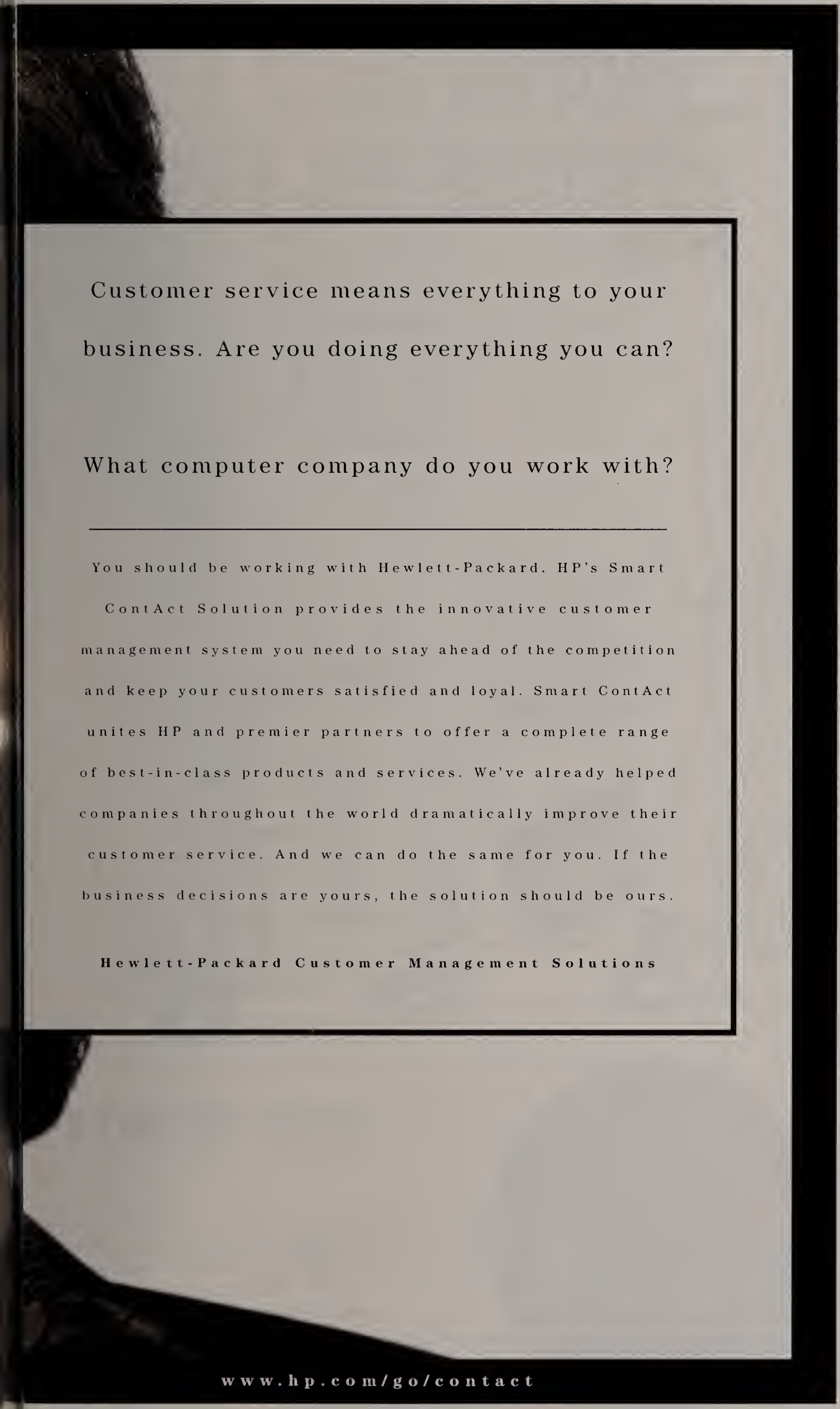Customer service means everything to your business. Are you doing everything you can?

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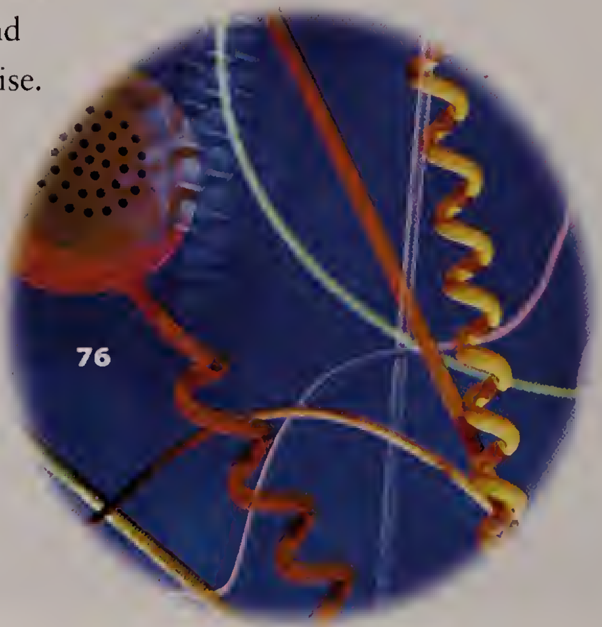

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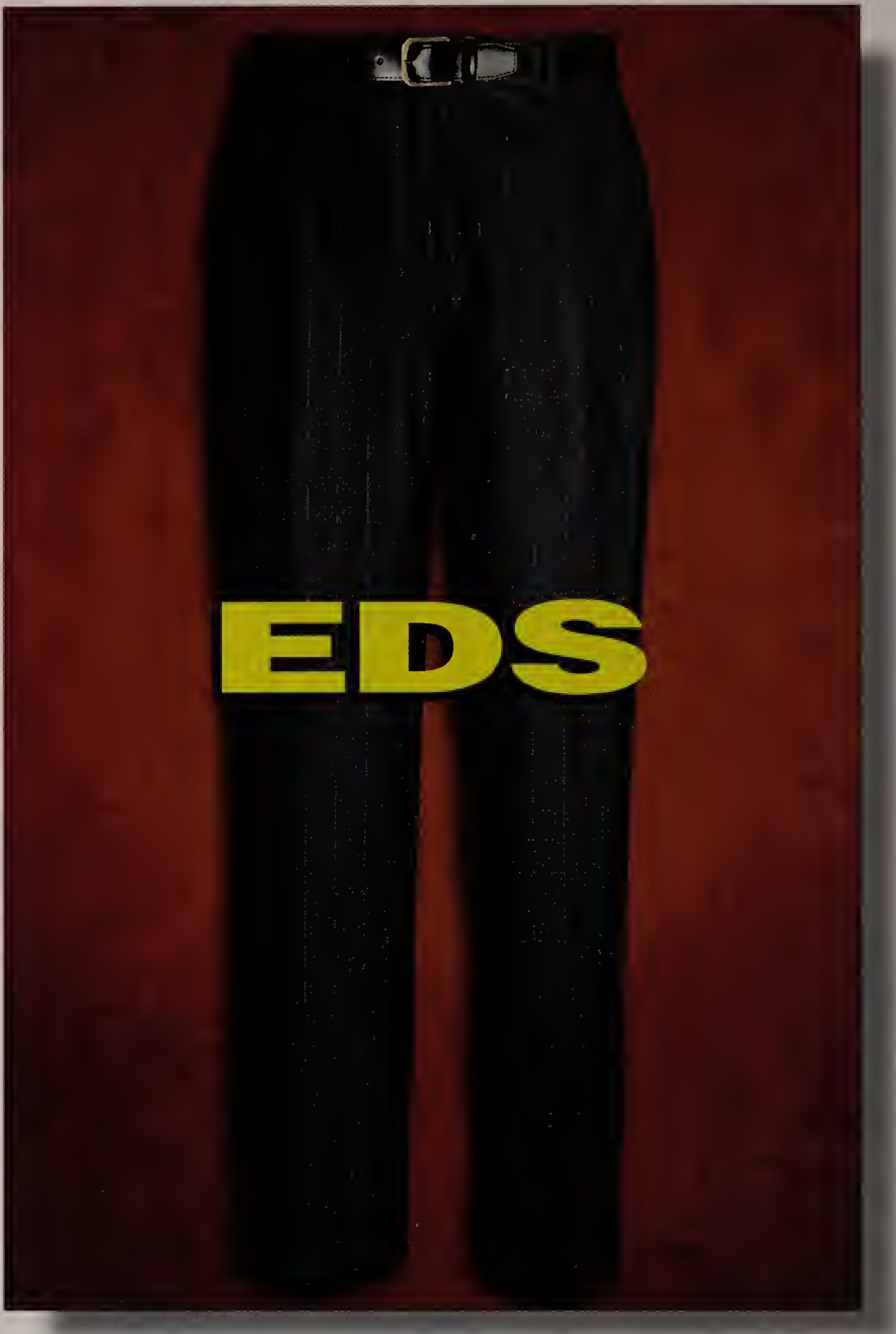

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In Box

LETTER FROM THE EDITOR, READER FEEDBACK AND HOW TO REACH US

CIO is now in its ninth year of publication. Since its inception, the editorial and design staffs have developed the magazine to reflect changing reader interests and to make *CIO*'s consistently excellent content more useful *and* more accessible. About a year ago, we realized that while the magazine had improved in general, some aspects were evolving more slowly than others; design was somewhat disconnected. It was time to step back and look at the magazine as a whole.

Around the same time, the editors began an active campaign to find out more about readers' information needs: What issues keep you awake at night? What information would help you succeed in your job?

Thus, we present this redesign. Our goal has been to retain *CIO*'s trademark classic look and feel while giving it a fresher, updated appearance. We also want it to be more reader-friendly—to take into account individual reading habits and ways of accessing information.

From a content perspective, we've maintained *CIO*'s focus on the business implications of information technology and management issues surrounding it while providing sharper coverage of the specific topics we target.

What's in the "new" *CIO*? Reader letters will be a regular feature of the magazine. Staff-written columns on management issues, IT metrics or managing change will appear in every issue. The View column, written by analysts from Gartner Group over the past year, will expand to include contributions from Forrester Research and Meta Group. Our technology coverage will move into a new section called Emerging Technology, which will include a column, a short write-up on an interesting trend and new-product information. Working Smart, our end page, will alternate with a Q&A with a prominent CIO. And to show you why our features are relevant to you, we're including Reader ROI boxes with almost every story.

Our mission remains the same: to be the executive's primary resource for effective application of information technology to meet business needs. Let us know what you think.

Abbie Lundberg

lundberg@cio.com

FROM OUR READERS

MORE ON THE CIO AS STRATEGIST

I can think of only a half-dozen times in my 20-plus-year career that I've taken the time to respond to an article, but your comments on strategist versus technologist in the June 1 issue gave me the incentive. I am the vice president and CIO of a $4 billion company, and I am not a technologist!

I have a CTO who reports to me and plays a critical role in our mission. I also report to the CEO, who loves to describe himself as my CTO. Our bimonthly technology breakfasts sometimes resemble a tennis match with me as the spectator, head bobbing left and right between my two CTOs.

My boss really understands the value of IT in making our business successful. He is driving changes in all areas, including leveraging technology. But when the business decisions are made, he wants me at the management table speaking English and talking about business strategy, not technology strategy.

In my last four jobs, which spanned two companies and typically lasted two to three years each, I spent 30 to 40 percent of my time on strategy in phase one (restructure, restaff and refocus, or start change), 40 percent on strategy in phase two (develop processes, build teams, create the agenda and start delivering real value through innovative services and

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In Box

significant solutions) and 60-plus percent on strategy in the third and final phase (continuously deliver value through new services/solutions and provide consistent high-quality service through reliable processes) before seeking a more challenging opportunity and starting the process all over again.

I asked my boss last year how much time he thought I should be spending on various areas. His reply was 30 percent external, 30 percent internal and 40 percent on my people and tactical issues. Interesting answer, isn't it?

I was compelled to write because I believe the "IT heads" must be CIOs, and I feel that most of my peers are CTOs. That's really bad news for businesses as far as I'm concerned but good news for me because there are lots of CEOs out there looking just for me!

Katherine C. Holland
Vice President and CIO
Peco Energy
Philadelphia

LEFT OUT OF THE GROUP(WARE)

Technical implementation and administration is a significant area that was left out of your otherwise great issue on groupware [March 1, 1996]. The omission is typical of the treatment of Notes and other groupware products. Your publication should address the questions CIOs should have for their staff members as the groupware process begins or spreads in the organization.

There are some critical implementation and administration issues you did not cover. What kind of training and preparation are necessary to create the Notes infrastructure? Notes is a technology that is laid down upon existing technology—on the workstations, network cabling, servers, telecommunications and other computer structures. Lotus training and certification focuses on the application and not on the computing environment in which Notes is placed! System administrators must become knowledgeable in networking issues, or network managers must become trained in Notes administration.

Notes security might be very different from the existing network security schemes. Security is based on certification of the users, ideally from a single hierarchical structure that allows for departmental or site control of the creation of its own users, but each Notes database is standalone in terms of its security structure. Lotus Notes does not give the organization top-down views of what databases/applications each user has across the Notes servers in the organization! Who manages the security access levels on each database application? Is it the developer? Is it the department manager? Is it the Notes administrator?

These are only two of the areas we hear about from Notes system administrators and their managers. In the haste to create organizational groupware products, we cannot neglect technical infrastructure and system administration.

Nicolas L. Behrmann
Director of Market Research
Interibex Workgroup Solutions
San Mateo, Calif.

SPECIAL FOCUS ON SAP

I just finished reading the section on SAP [June 15, 1996] and thought it was excellent. This is one of the reasons I read *CIO* before any other mags. Part of my job as tech adviser to the head of the division is to find articles that are on his level and mark the important sections. This is definitely one group of articles that will dry up my highlighter!

Keep up the fine reporting.

Ben Stern
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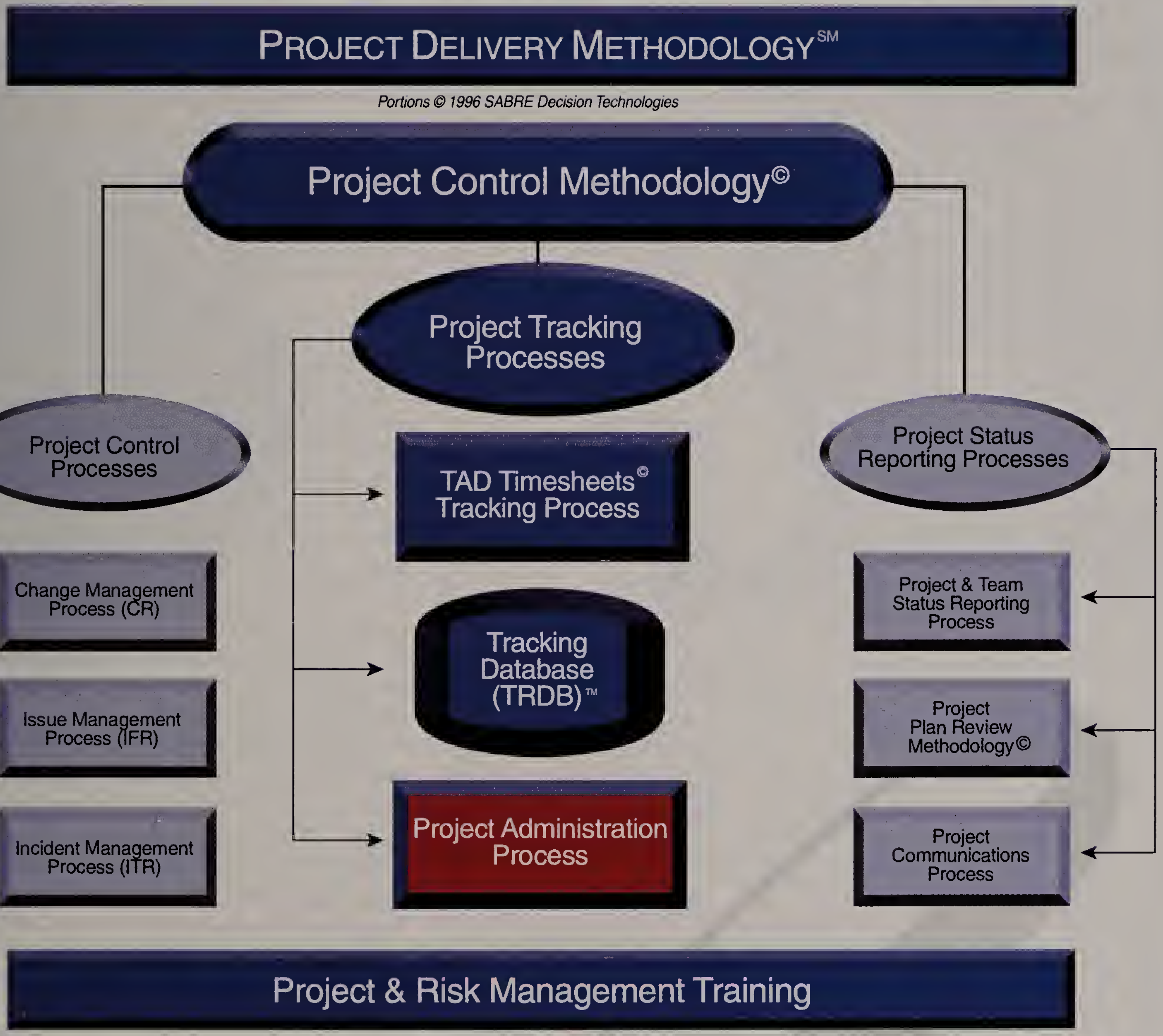

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THIS MAGAZINE HAS A TOUGH AUDIENCE. A CIO, with one foot in the technology world and the other in the business world, requires a unique mix of information, and it's always a challenge for us to find out what you want to know about, when you want to know it and how you want it delivered. Who better to help us meet this challenge than a select group of *CIO* readers with a collective finger on the pulse of the profession? The 20 members of our 1996-97 Editorial Advisory Board hail from organizations and institutions large and small, private and public. They have already proved valuable in helping us identify and shape topics for coverage and the overall direction of our offerings, including *CIO's* new columns. We thank them for their ongoing assistance and acknowledge them here by name.

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ONGOING METRICS

In your July editorial, you stated that managers need real data to back up their analyses or they'll be laughed out the door. I agree with you 100 percent.

The government and many companies may have a vision, but they lack several key components to achieve it. I don't necessarily agree that the grid should be used simply to "engage" discussion. I believe the grid should be used to measure where a company is today and to set a target for where a company wants to be in the future.

You can accomplish this by doing a few critical things. First and most important, devise a plan and implement it! It's great to have a goal, but you must be able to expand on how you plan to get there and demonstrate what the benefits will be as you reach it.

Establish a measurement program. Start small and set specific goals. You need buy-in from project managers, so give them some incentive to participate in the measurement program—for instance, a tool or method of producing better project estimates. This will accomplish two things: First, with better estimates, those managers will, hopefully, get projects done on time and within budget. And second, you will be collecting all the information necessary for the measurement program.

Senior management must sponsor the measurement program, or the program will die a quick death. Management must review the measurements each month and make adjustments as necessary. In the government IT executive's case, his grid could be produced each month with meaningful data supplied by the project managers who are now doing better project estimates.

It is also important to make sure the IS department is working on the right projects. The incentive for any company or government to improve its software development process is ROI. Where can a company get the most bang for its buck? Are all the projects that a company's IS department is working on providing the best return? For every project, a company must look at the size, risk, cost and corporate value and prioritize its projects based on those criteria.

Ron Schaefer
Commercial Products Executive
Union Pacific Technologies
St. Louis

Please send letters to the editor to letters@cio.com *or to Letters, CIO Magazine, 492 Old Connecticut Path, P.O. Box 9208, Framingham, MA 01701. Letters may be edited for length or clarity. If you welcome feedback from other readers, please include your e-mail address.*

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Trendlines

NEWS, INSIGHT, HUMOR, REVIEWS

Edited by Cheryl Dahle

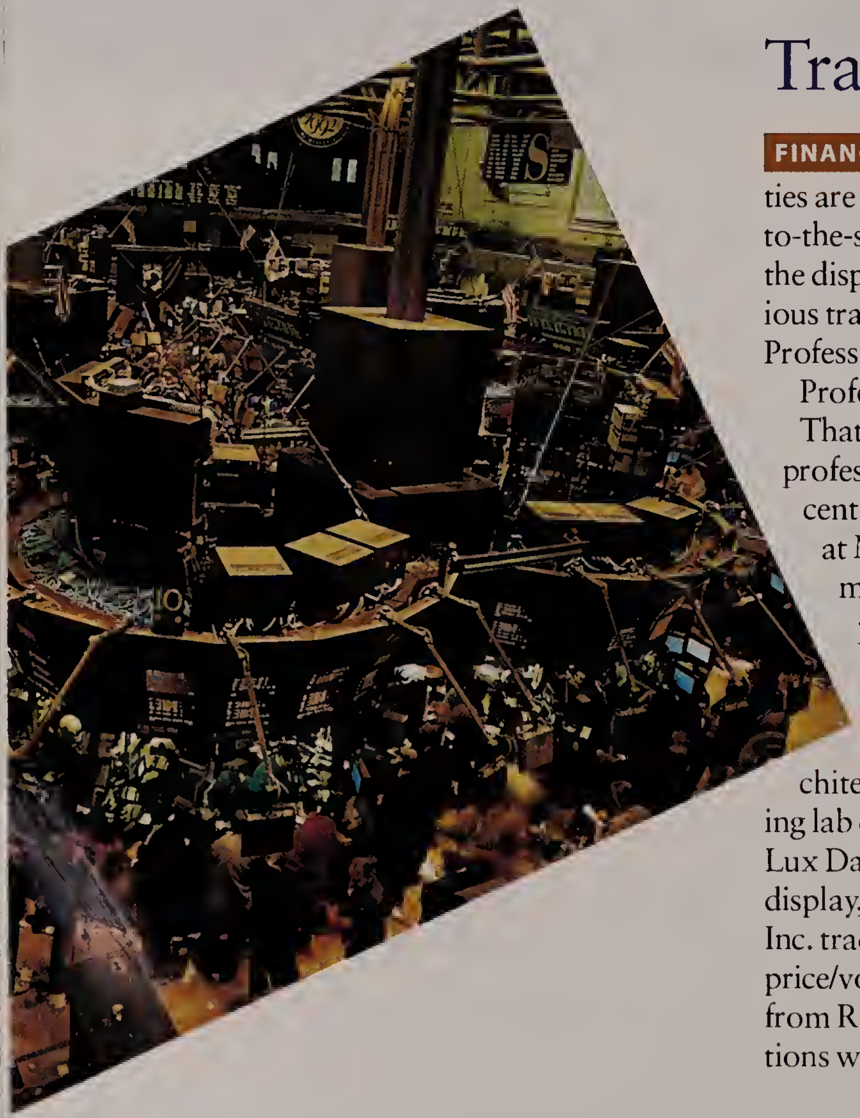
IT Does the Math

PRODUCTIVITY Ever wonder how much that network downtime is costing you, not only in terms of labor and equipment to fire it back up but in terms of lost productivity? The minutes your company's employees spend tapping their fingers on the desk instead of the keyboard could cost you. A new Web site offers a way to estimate just how much.

The Cost of Network Downtime Calculator allows IS professionals to determine the financial effects of network downtime in a few simple steps. Accessible via Interpose's Web site at *www.interpose.com*, this Sun Java applet automatically estimates revenue loss from both planned and unplanned server outages by factoring in information provided by the network administrator visiting the Web site.

This device is instructive for managing systems both big and small—if systems were up 96 percent of the time, which is more than most networks ever are, a 300-user network would lose $840,000 annually in productivity and revenue.

The calculator processes information the user enters, such as annual gross revenue labor rates per hour, and gives estimates of lost revenue and productivity per year for both planned and unplanned outages. ■



Trading Places

FINANCE The Dow is up, commodities are down and trading is furious. Up-to-the-second stock prices flash across the display screen while a score of anxious traders tap their PCs and handsets. Professor Lo oversees the frantic scene.

Professor Lo?

That's Professor Andrew Lo, finance professor and coordinator of the recently opened "virtual trading room" at MIT's Sloan School of Management. The institution created the project to allow MBA students to gain firsthand experience in Wall Street finance. Designed by Dyer/Brown Associates, Architects, the 3,000-square-foot trading lab comes fully equipped with Trans-Lux Data Walls for market information display, a Teknekron Software Systems Inc. trading platform and near real-time price/volume data (delayed 15 minutes) from Reuters. It includes 23 workstations where students analyze data and test investment strategies on Pentium-powered Acer PCs.

The trading room's mission is twofold: to help students use "real" tools to learn high finance and to allow MIT financial experts to research new territory in the financial realm. Currently, students study investments and financial markets, while researchers probe the influence of psychology on trading and development of new investment vehicles.

"There's nothing like it," says Lo, whose students got their first taste of the trading room this spring. Before it opened, students could manipulate some financial data on PCs, and they occasionally took field trips to the New York Stock Exchange. "But it's not the same as being able to really do it in a trading exercise," Lo says. "It gives them an edge. They will have been in this environment; they've seen the pressure traders work under."

The financial trading system software

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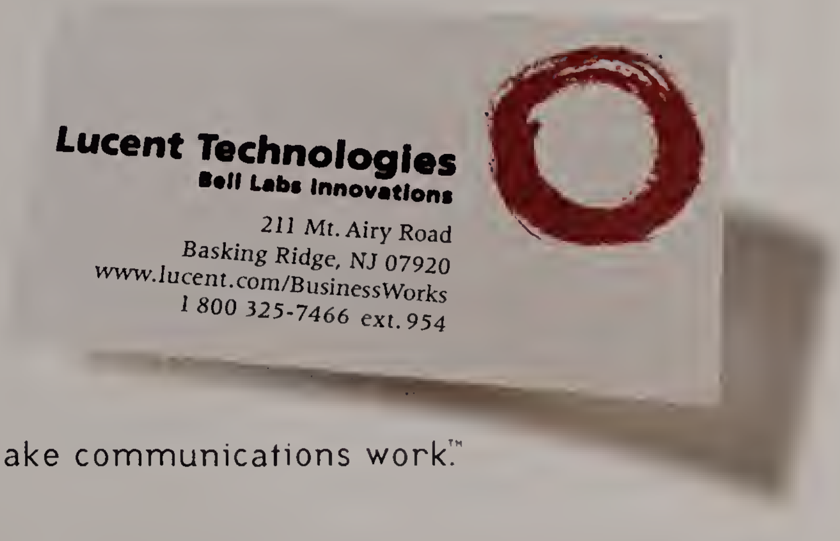

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Trendlines

Findings **Security Gaps**

ILLUSTRATION BY HAL MAYFORTH

Substandard Policy

Tsk, tsk. The legal eagles at Gordon & Glickson P.C. have a few scoldings for CIOs who let their employees act like a bunch of information hooligans, running wild on the Internet and handling company secrets carelessly.

According to the Chicago firm's research, many businesses are lax in developing and documenting information and security policies, which are needed to educate users as well as protect corporate assets. Gordon & Glickson recently surveyed 119 CIOs at Fortune 1000 companies. One-quarter of the respondents say they have no formal policies relating to use of information technology. Many of the existing policies have glaring holes, such as failure to address electronic mail usage.

That creates a pretty significant risk of security breaches, the company warns, considering that a whopping 97 percent of the companies support mobile users and open corporate systems to remote access. "We find cases where passwords are kept on the laptop, and the computer can dial in automatically," says Stuart Smith, a partner at Gordon & Glickson. "There is very little protection in place to make sure that if that laptop is stolen, the system will be secure."

The survey also indicates that while the vast majority of companies (90 percent) designate a single person—most commonly an IS worker—to be responsible for system security, many lack defined procedures for that person to follow. Less than half conduct routine compliance audits.

The lawyers say the following formal policies can prevent a lot of headaches: Conduct an audit to determine how they are being used or accessed; write a basic policy and update it frequently; and make sure the updates are distributed to all employees, not just new hires. Three out of 10 survey respondents with written policies only distribute them once.

"The more they see [the policy], the better off you'll be," Smith says.

But no policy will stop an employee bent on intentionally destructive behavior. In those cases, Smith notes, well-documented policies can provide the company a basis for legal action. Of course, then you'll need a good lawyer.... For the complete results of the survey, contact Gordon & Glickson at 312 321-1700 or *www.ggtech.com.*

–Derek Slater

Net Losses

Lack of standards causes headaches

Percentage of companies that have been involved in legal action resulting from employee use of information technology: **12%**

Percentage of the companies that allow employees some level of Internet access: **98%**

Percentage of companies that say they would block all personal use of the Net if technology allowed: **75%**

Number of people who say their company has "experienced negative impacts associated with Internet usage," whether from lost productivity, virus-infected downloads or copyright infringement: **1 in 6**

Sloan uses was developed by Carnegie Mellon University in Pittsburgh, whose graduate school of industrial administration pioneered the virtual trading room with its financial analysis and security trading (FAST) program. Sanjay Srivastava, professor of economics and finance and one of the developers of FAST, said the original goal was to develop a trading-room lookalike. But though the design worked well as a lab, it made traditional lecturing difficult, so the project was scaled back into a lab only. The system has been adopted by institutions in Europe, Asia and South America. "It is not a substitute for what we did before," Srivastava says, "but it lets us do things a lot more deeply."

–Tom Field

Flexing New Muscles

MEDICAL TECHNOLOGY

I do believe I've strained my sphenomandibularis on a piece of taffy. Never heard the phrase? Hardly surprising considering that the sphenomandibularis, a facial muscle that extends from behind the eye socket to the lower jaw, was discovered only recently using Engineering Animation Inc.'s (EAI's) 3-D computer visualization technology.

The muscle, discovered by dental researchers at the University of Maryland at Baltimore last February, is featured in The Dissectable Human CD-ROM, an interactive anatomical atlas from international

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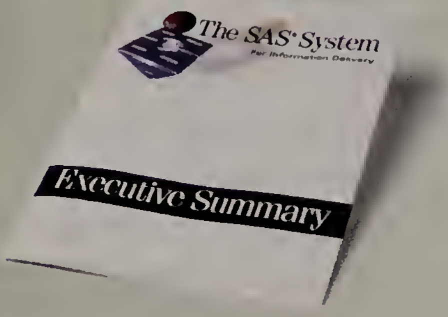

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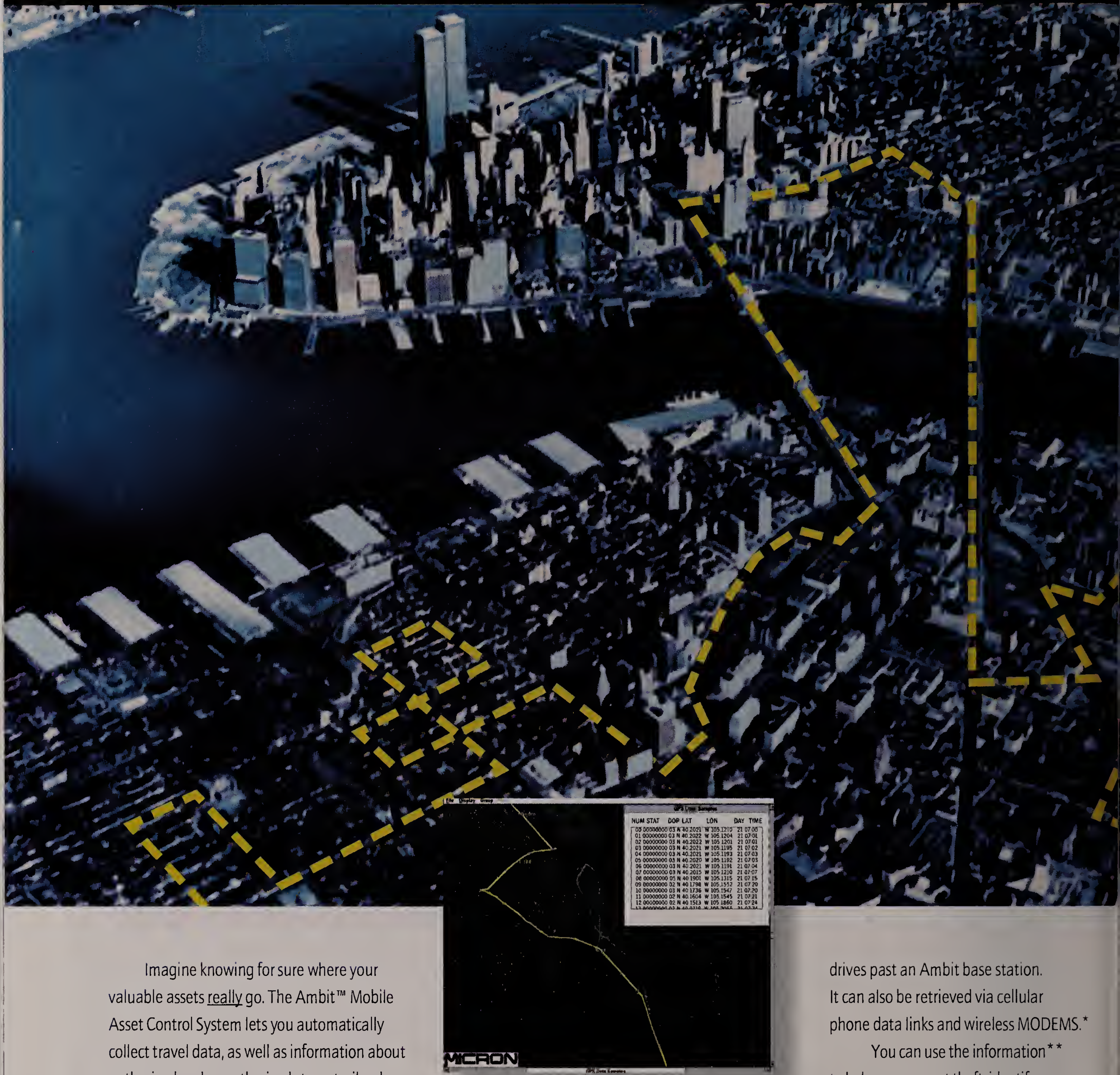

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State of the Smart

APPLIED TECHNOLOGY Smart-card technology is plenty smart, but so far it's being used more for its brawn than its brains. In France, for example, the government has long required banks to use the technology to reduce ATM and credit card fraud, an application that relies on the card's memory capacity rather than its technological capability. The smart-card chips are like tiny, fully functioning computers, with readable—and more importantly, writeable—memory that needs only an electronic jump-start from a host machine to begin thinking.

The generous memory of the copper-colored chips lets French banks slather customer account information with encryption code, says Carol Fancher, technical marketing engineer for Motorola Inc. French merchants can also do instant, on-site account and credit verification without incurring the (still relatively high) costs of checking information via phone lines. The plan seems to have worked: Fraud has dropped from 3 percent to 1 percent of credit card and ATM transactions in France, according to Fancher. This limited reliance upon telecom lines for transactions also has dramatic potential for developing countries, she adds, which have few banks and few reliable phone connections.

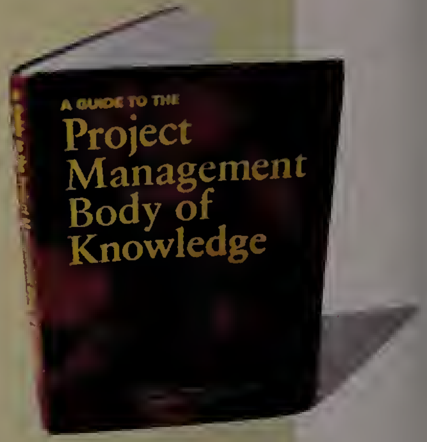
Yet in the United States, where phones lines are reliable and cheap, using smart cards as account bodyguards has limited appeal. Increased functionality is the key, says Fancher. "Dumb" smart-card applications like prepaid telephone and cash cards are beginning to take off here, but the "co-branding" craze has more long-run potential, she says. Smart-card chips' generous memory means they can handle services more customer-specific than frequent flier miles or piddling rebates. "If a bank has a significant segment of elderly customers, you could offer them a link into AARP services through the card," muses Jim Farrell, a spokesman for Motorola, which owns 70 percent of the world's smart-card chip market. The cards could also serve as personalized repositories for social services like health insurance and government benefits like food stamps. Fraud would be reduced and "it would destigmatize food stamps because [recipients are] using what looks like a normal credit card," he adds.

–Christopher Koch

The ABCs Of Project Management

An outline of the process

FOR AN I.S. MANAGER, it's the stuff that dreams are made of: breaking project management down to a process that's organized, cost-effective and repeatable. While no out-of-the-box solution will get you there, a new publication from the Project Management Institute might help.



A Guide to the Project Management Body of Knowledge is a basic reference for project managers that defines terms and outlines the steps of this unwieldy and time-consuming process.

The first part of the book provides a basic framework for understanding project management, including definitions of key terms and concepts, a description of the broader context within which project teams operate and an overview of how project management processes interact. The second half provides information on managing nine aspects of a project, including integration, scope, time, communication, risk and procurement.

For more information on the book or to order a copy, call 610 734-3330. ■

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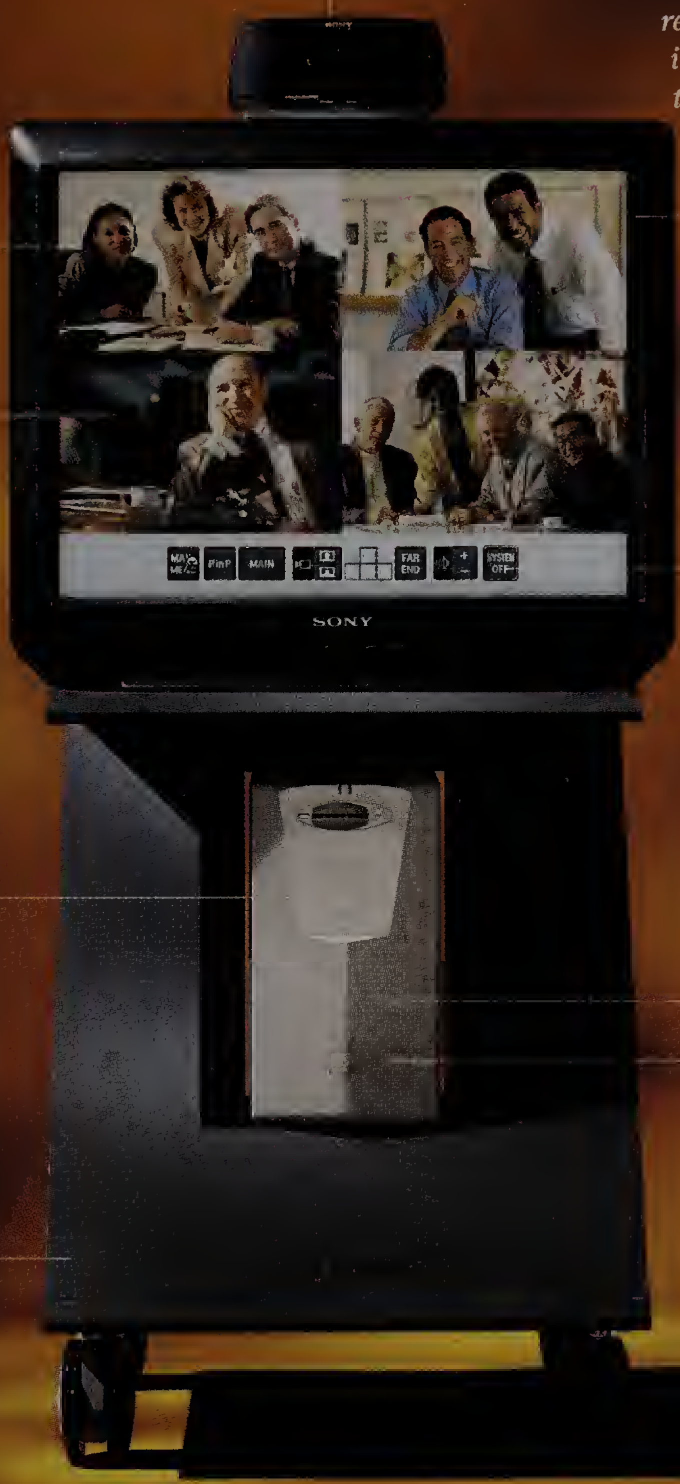

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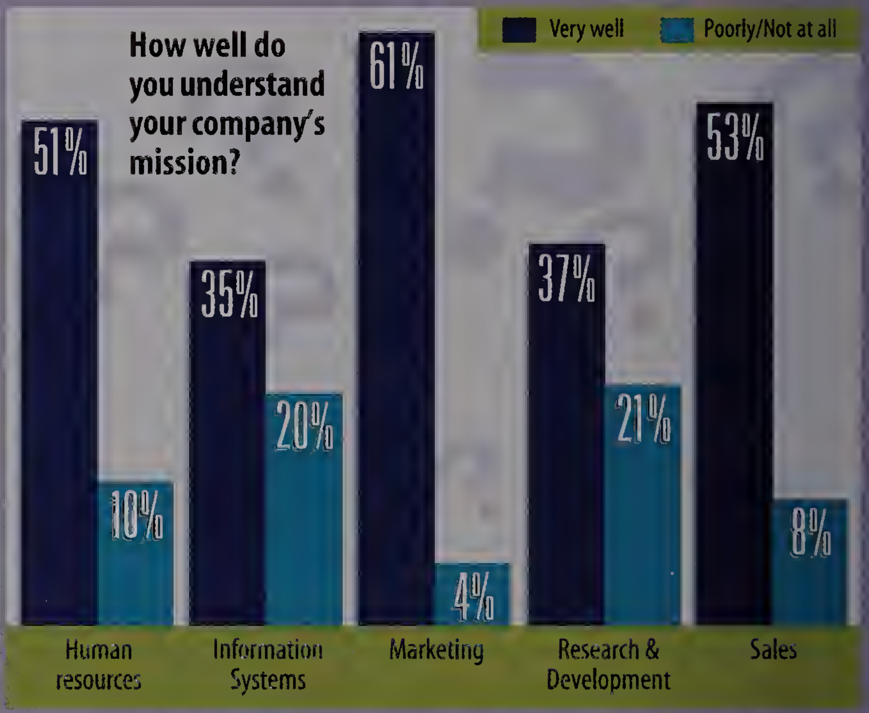
Trendlines

Business Drivers? Sure, Where Are We Going?

ACCORDING TO A 1996 SURVEY by the research wing of the American Management Association, 600 senior executives reported that many of the divisions in their companies understood the company's mission, vision and values "poorly or not at all." And no division ranked higher than 61 percent for truly understanding the company's raison d'etre.

IS came up comparatively clueless next to marketing and sales. ■



Dogbert to the Rescue

TRAINING Which of the following selections correctly completes this thought: Users should call tech support... A) never—it's a sign of weakness. B) only when they're lonely; or C) often—they'll get much better service once they get to know you personally.

Dogbert never actually answers this question from his Do-It-Yourself Tech Test in the business video *Technology Does the Strangest Things!* but his point is clear: Users, managers and technology support teams need to find a better way to work together. With a little help from Boston-based comedy troupe Renegade Duck and Elliot Masie, president of The Masie Center, an international think tank dedicated to training technology, Dogbert's video aims to give viewers a new attitude about technology. "People very often in their attempts to get along with new technology get a little quirky," explains Masie.

The video's advice isn't exactly cutting-edge—one tip for users on how to increase their self-reliance suggests that they try solving the problem themselves (duh) before calling tech support. But if nothing else, the video might spawn a laugh and improve morale. The 24-minute video costs $99. To order, call 800 208-3535. ■

Network News

Percentage of network problems that can be traced to design, configuration, implementation or coordination errors:

Less than 40

Number of companies that feel they have adequate documentation on their networks:

1 in 4

Number of weeks most Fortune 1000 companies require to implement network changes at the department level:

6 to 10

Number of projects that are not installed successfully on the first attempt:

Less than 1 in 4

Percentage of client/server application deployments that are not meeting the service level commitment in availability and performance originally made to the business units:

Less than 50

Percentage of time and staff the average Fortune 1000 networking organization dedicates to network planning, design and implementation tasks:

40

Source: "Network Design and Capacity Planning," April 1996, Yankee Group

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Executive Counsel *By Christopher Koch*

MANAGING YOUR CAREER, STAFF AND PROFESSIONAL RELATIONSHIPS

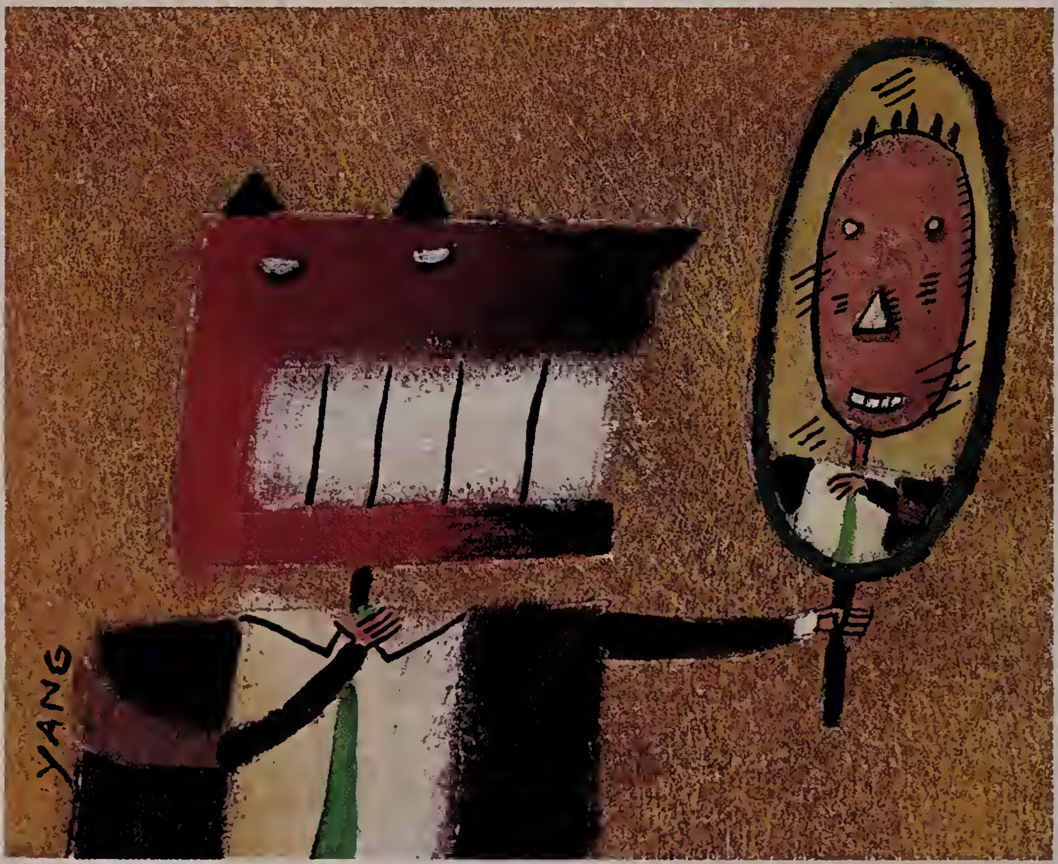
Beating a Bad Gap

Do you know what the business thinks of you? Or do you just think you do?

THE UNAVOIDABLE TENSIONS in the relationship between IS and the business can leave the former with a splintered image in the organization. IS looks in the mirror and sees Dr. Jekyll, the brilliant technician, while the business looks at IS and sees Mr. Hyde, the uncommunicative techno-savage. The first step in closing this perception gap is to find out just how mean and ugly a monster the business thinks IS is.

Internal customer satisfaction surveys traditionally have offered a start, but they don't do enough to explain the gap. They're mostly relics from IT's glass-house days, offering a one-dimensional view of its ability to keep networks up and computers connected—services users have come to expect rather than appreciate. Unless the content and goals of the surveys change, IS's ability to understand its image and how IS can better serve its customers is left entirely to its own diligence.

Duracell International Inc., the Bethel, Conn.-based maker of batteries, might never have resolved a stubborn help-desk issue had it not been for CIO Debbie Gillotti's determination to keep asking questions after the survey numbers came back. When she first surveyed Duracell's 700-person corporate headquarters staff in 1994, "I knew we were going to get slammed on the help desk," she recalls. Poor response time, inadequate follow-up and lack of knowledge of users' varying application environments had created bad blood in the company.



So Gillotti revamped the process. She pushed for standardized applications and beefed up the training for help-desk staff. When the 1995 survey numbers came back, Gillotti expected a good rating. Despite all the changes, the results were only slightly above average. Users still weren't getting the answers they needed.

So Gillotti organized some focus groups with different departments to ferret out the reasons behind the numbers. She discovered that many of the problems required solutions that were more complex than simply improving the help desk's skill level. At the time, the company had offices in nine buildings, each with a sprinkling of IS people who fielded informal help questions without necessarily telling the help desk. Without knowing who was responding to users' problems, Gillotti couldn't track the resolutions to those problems. She found that people often were getting wrong answers or no answers at all. The organizational structure of IS complicated things even more. Staff was split between corporate headquarters and Duracell's USA division, with users not sure where one group's responsibilities ended and the other's began.

Gillotti responded by consolidating the two IS staffs and creating a team staffing model for the help desk. With a wider range of skills available at any given moment, users are now less likely to buttonhole IS staff members. Duracell helped by moving everyone in Bethel into one building in 1995.

Gillotti surveys frequently (once a year since she joined the company in 1993) to maintain a sense of continuity between actions and words. The continuity allows Gillotti to keep isolated problems from poisoning IS's image across the company. For example, when Gillotti last surveyed the headquarters, IS was in the midst of

ILLUSTRATION BY JAMES YANG

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Application Development Trends

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You've got questions about the year 2000 problem?

The year 2000 is looming. Will your systems be ready in time? The more you know about managing this challenge, the better off you'll be. But *CIO* Magazine couldn't possibly cover all the implications of the date conversion issue in one article. That's why, in addition to the feature story in this issue, beginning on Page 52, we've extended the discussion to our new **Online Feature Forum** located at *www.cio.com/forums/year2k.html.*

Join us **Sept. 16-30** and interact with industry experts, *CIO* writers and editors, and other CIOs who are grappling with this problem. Find out lessons learned, benefits gained, hardships endured.

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Participants:

- **Kathleen M. Adams**, associate commissioner for systems design and development, Social Security Administration; chair of governmental interagency task force on the date conversion issue
- **Jim Gillespie**, project manager, Yellow Technology Services
- **Jim Jones**, managing director, Information Management Forum
- **John Jung**, VP of systems development and delivery, Chubb Insurance Co.
- **Leon A. Kappelman**, co-chair of the SIM Year 2000 Working Group; associate professor, University of North Texas in Denton
- **Matt Kistler**, project manager, Andersen Consulting
- **Miryam Williamson**, contributing editor, *CIO* Magazine

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replacing a sales-force automation application that was giving the salespeople fits. "The survey gave us the opportunity to get back to those folks and give them a sense that the [problems they faced] wouldn't be permanent," she says.

GILLOTTI'S FOLLOW-UP HAS PAID off, but must the task of getting a clear view of IS's image always be so difficult? Part of the problem lies in the typically rigid methodology of surveys, says David Foote, program director with the Meta Group's Executive Council program. Most IS departments approach customer satisfaction surveys the same way they used to approach systems projects: Find out what's on users' minds and get back to them with a plan IS believes will fit their needs. "The surveys only attempt to find out what's going on today; they don't try to identify trends," laments Foote.

Foote is trying to wring more insight out of this transactional, one-way approach to discerning what the business thinks. "IS needs to look at these surveys as a way of improving its working relationship with the business," he says. "If you look at it through that filter, the questions will change completely. You'll begin asking things like, 'Did we increase your efficiency?' 'Were we clear in our communications?' "

The method for getting at these issues works something like a round of *The Newlywed Game*. Like the newly minted couples on the game show, IS gets grilled about what it thinks the business will say on the survey. While Foote skips the zany questions about in-laws and personal habits, the underlying theme is the same: You don't know each other as well as you think you do.

At one company Foote worked with, IS was asked to predict how senior managers would rate its responsiveness and value-added. The gaps were wider than anyone in IS had imagined, especially in the murky realm of value-added, which IS predicted executives would rate slightly above average, but which executives panned, saying IS added only negligible value. When plotted on a chart, the gaps prompt much valuable—if not always friendly—conversation.

Foote elicits even more critical information by asking both IS and the business to predict whether their current perceptions will change in two years or remain the same. The predictions act as a kind of trend analysis.

At a manufacturing company Foote surveyed, the issues of project prioritization and justification revealed a dangerously large perception gap. "This issue was an emotional one for [IS staff]," says Foote. "They indicated that things would get much worse in the next few years—almost hopelessly so." IS believed decisions on priorities and justification were political, personality-driven or customer-driven rather than based on an objective system of evaluation. Meanwhile, the business users did not see any major problems, nor a downward future trend. Business users called IS "defensive" and saw shifting priorities as "business as usual" in a competitive marketplace. "They were both wrong," says Foote. "What was missing was a shared system for project management and resource assignments."

To lend further urgency to the discussion, Foote asks both the business and IS to rate each issue's importance to competitive success in the future so that the list can be prioritized. "If IS gets an average rating on something the business believes is very important, that has more impact on IS's image than a very good rating in an area the business doesn't deem as being important," says Foote.

THAT ISN'T TO SAY, HOWEVER, that every area of the business will agree on the relative importance or quality of IS's work. In one company, Foote asked business unit managers and senior management to rate their working relationship with IS. The rating from senior management came out far better than the business unit's perception of IS. "People at the top of the organization have stock options and other rewards for getting along with their peers," Foote says. "What's the incentive for a programmer to treat users nicely? There usually aren't any."

There's a covert strategy in pinning down the gap between IS's self-image and its reputation: IS gets the information it needs to attack the causes of its image problem rather than relying on transparent PR tactics or overpromoting its successes to "sell" itself. That allows IS to improve its image by improving its substance, a meatier goal than learning a better pitch. "IS is evolving toward being an integrated entity in the business," says Foote. "IS has to build a sense of collective ego with the business, where the agenda for the group is more important than the agenda for individuals." CIO

Senior Writer Christopher Koch can be reached at ckoch@cio.com.

Going Downhill

Stop your image entropy

LEFT UNTENDED, IS'S REPUTATION has a natural tendency to decline. Chalk it up to what Forrester Research Inc. analyst Russ Maney calls the "utility paradox": Networks are invisible unless they're down, and failed projects remain in the corporate memory longer than successful ones.

IS's internal marketing efforts seem to have little effect on the downward trend. Of 45 IT executives surveyed last spring by Forrester, 75 percent said they felt the business viewed them as merely competent. Worse, 25 percent said they were "invisible" in the eyes of the business. Those who tried to market themselves were just as likely to project a negative image as those who didn't.

To combat that problem, Maney suggests that IS keep track of its business impact in three realms: cost/revenues, quality and timeliness. If the systems project ran over budget, how much did it save the business in the end? If a manufacturing automation system was delayed, how much did it improve quality once it was installed?

For more information about the report "Rebuilding IT's Image," contact Forrester Research at 617 497-7090.

–C. Koch

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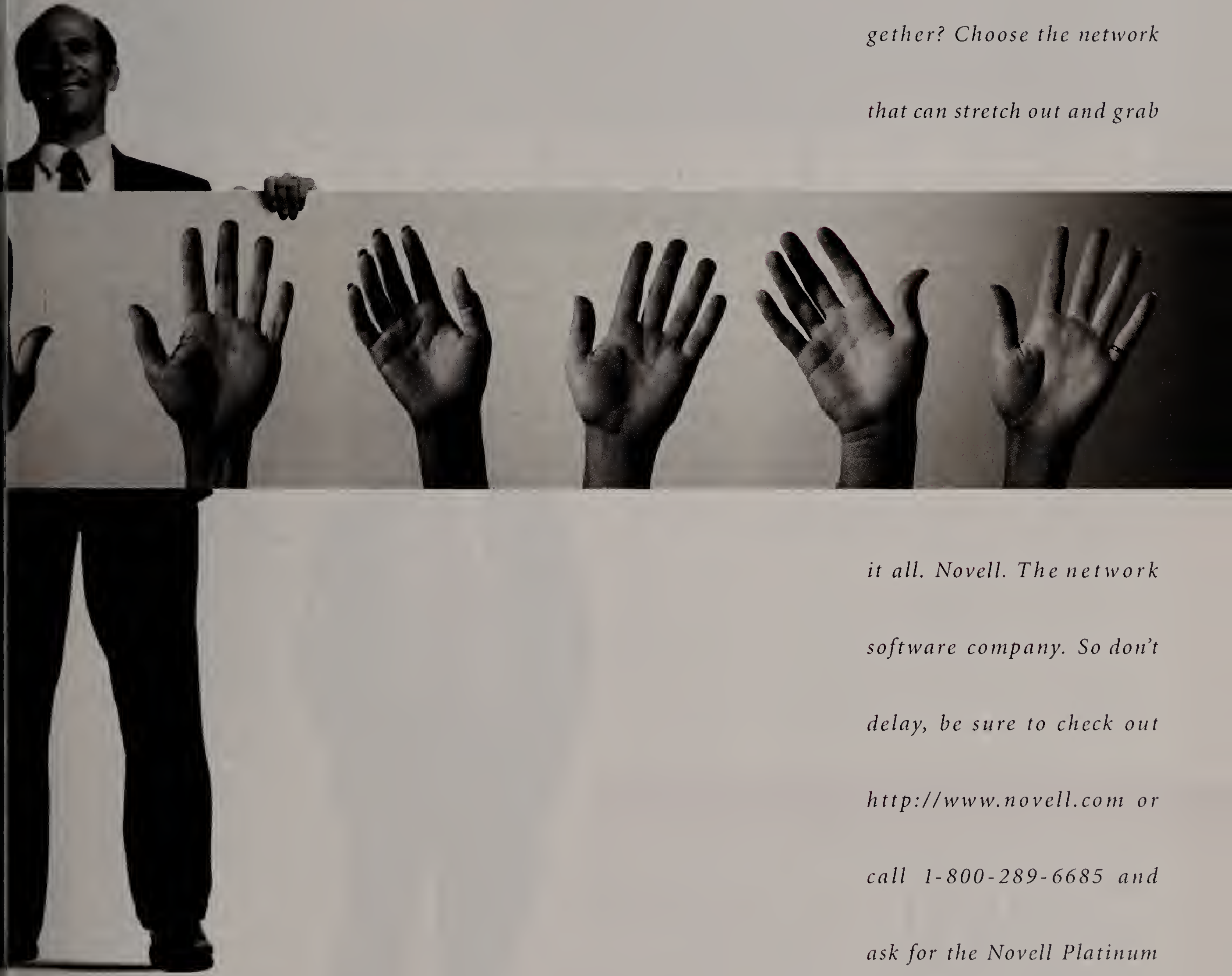

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Think Tank *By Tom Davenport*

MAKING THE MOST OF AN INFORMATION-RICH ENVIRONMENT

We Have the Techknowledgy

New tools for knowledge management

STUDIES SHOW THAT ONE OF the primary reasons you read this restyled mag is to keep up with new technologies. I figure I had better get with the program, since I usually prattle on in this column about the soft stuff.

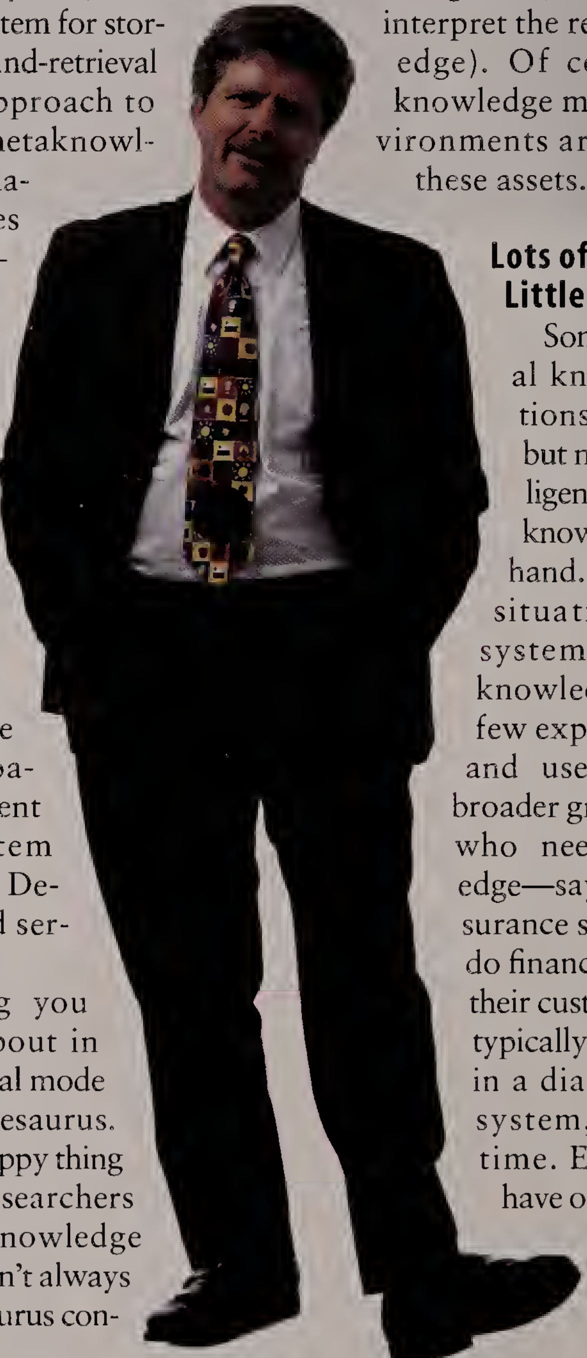
Therefore, what follows is the latest and greatest in knowledge-oriented technologies—those that support working with high value-added information. (But perhaps I will sneak in a word or two about how these technologies are used by people, just in case people are reading this rather than computers.)

The whole Notes versus Web debate is getting a bit tiresome—everyone agrees that the capabilities of the two are merging. Just the same, I can't resist adding my two bits. If you're starting a knowledge management project today involving publishing, discussion and search, I'd go with the Web because it's a lot easier to understand. If you've been doing this type of knowledge management for a while, you've probably been doing it in Notes, and I see no reason to switch now. Notes particularly excels at the "lessons learned" form of knowledge management, which allows people to post information gleaned from experience in a central place where it can be shared and "discussed" online.

If you plan to use Web technology for knowledge management (particularly the search and retrieval of structured, document-based knowledge), don't think that a little dab of Netscape'll do ya. A complex suite of tools is normally necessary to capture the information, store it and allow broad access. The usual requirements include hypertext markup language (HTML) publishing tools for getting the goods into the system; a relational database system for storing it; text search-and-retrieval engines; some approach to managing the "metaknowledge," the information that describes and facilitates access to the knowledge you've got on hand; plus, of course, your preferred Web browser and server. If this seems a bit overwhelming, some organizations sell a bundled Web-based knowledge management capability, like Sequent Computer System Inc.'s Knowledge Depot products and services.

Another thing you need to think about in search-and-retrieval mode is developing a thesaurus. Knowledge is a sloppy thing to structure, and searchers will look for knowledge using terms you can't always anticipate. A thesaurus connects the terms by which you've structured the knowledge with the terms employed by the searcher.

Unfortunately, these tools don't go beyond the "lessons learned" discussions and search and retrieval of structured knowledge to address other knowledge management problems. These document-oriented technologies work well for broad knowledge domains when there is no right answer to a problem or when there are many different answers scattered around the organization. These tools also require substantial user time (to search the database and read the retrieved knowledge) and intelligence (to synthesize and interpret the retrieved knowledge). Of course, not all knowledge management environments are blessed with these assets.



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Lots of Time, Little Smarts

Some organizational knowledge situations have the time, but not the user intelligence, at least in the knowledge domain at hand. That is the best situation for expert systems, in which the knowledge of one or a few experts is captured and used by a much broader group of workers who need the knowledge—say, a group of insurance salespeople who do financial planning for their customers. The user typically needs to engage in a dialogue with the system, which takes time. Expert systems have one other requirement: Because these systems are difficult to

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maintain or add knowledge to, the knowledge domain needs to be fairly stable. American Express, for example, still uses its Authorizer's Assistant expert system for credit authorization because the factors that predict good credit risks (or deadbeats) have remained fairly constant. On the other hand, Digital Equipment Corp. stopped using the XCON configuration system because its product line changed constantly and the system was too difficult to maintain. One recent research study found that only a third of the expert systems developed in the '80s were still in use by 1992, but the fate of more conventional systems may not be much better. Another option in this category is constraint-based systems, which are suited for situations with less quantitative data than neural networks require. Constraint-based systems capture and model the constraints that govern a complex problem situation. Because they are usually object-oriented underneath (rather than rule-based), they are easier to modify than expert systems. Constraint-based systems are currently being employed in the configuration of complex products as diverse as Boeing airplanes, Digital and Hewlett-Packard computers, and office furniture layouts—all using systems from Trilogy Development Group.

Go With the Know

The type of knowledge management tool you choose should be determined by two criteria: **1)** The amount of time you have to find an answer to a given query; and **2)** How much knowledge users have of the domain in question. Here's a breakdown of types of tools:

Tools	Time	Knowledge
Expert Systems	more	less
Constraint-Based Systems	more	less
Case-Based Reasoning	less	more
Knowledge Component Analysis	less	more
Neural Networks	more	more
Web	less	more
Lotus Notes	less	more

Less Time, Not So Dumb

If you have little time and knowledgeable users, you have a different set of problems. Take customer support or "help desk" environments, for example.

These processes are usually performed (often at IT vendors, by the way) by bright analysts, but time is of the essence because the customer is on the horn in real-time. In this case, there are a couple of options. If your users are only somewhat expert—capable of understanding a problem but not of solving it or classifying its symptoms—then case-based reasoning is your tool. CBR applications require someone to input a series of "cases," which represent knowledge about a particular domain expressed as a series of problem characteristics and solutions. When a customer analyst is presented with a problem, its characteristics are compared with cases in the application, and a match is selected.

Inference Corp. in Beaverton, Oregon is the leading vendor of CBR tools, which are used in a number of customer support environments, including Compaq Computer Corp. (Houston), PeopleSoft (Pleasanton, Calif.), Xerox Corp. (Stamford, Conn.) and Broderbund Software Inc. CBR works best when one or a few experts construct the cases and maintain them over time. If you have a large group of knowledge workers whose expertise you want to tap, you might want to look elsewhere.

Another tool, SolutionBuilder, was developed by Seattle-based Primus Corp. for the Customer Support Consortium, a group of more than 60 high-tech companies working together to solve problems of knowledge management in customer support. Primus has developed an approach to managing customer support knowledge (and eventually other types) that involves breaking down a problem or situation into its knowledge components. (The company hasn't given it a name, but I call it "knowledge component analysis.") The support analyst can classify knowledge about the problem received from the customer as a fact, symptom, change (in the customer technology environment), cause, fix or negate (a fact that is clearly irrelevant to the current problem). He or she can also add new knowledge components about old or new problems. An object-oriented database creates dynamic relationships among the components to yield a solution to the problem. It's an empowered, democratic approach to knowledge management, but it requires an ability to classify knowledge components that not all users possess.

Tons of Time, Lots of Smarts

If you have a lot of time and a user with a PhD in statistics, a neural network is just the ticket. This statistically oriented tool excels at using data to classify cases into one category or another. It requires a lot of (normally quantitative) data and a high-powered computer.

Neural networks can yield accurate classifications of cases, even with many related variables. They require a smart user because the statistical interpretation of results can be very tricky. However, neural networks are something of a "black box"—it's not easy to explain why they did what they did. Smart businesspeople, as opposed to very smart statisticians, may not like them for that reason. Hence Fidelity Investments, which generally hires smart users as fund managers, no longer uses neural networks to select stocks in the Disciplined Equity Fund, but rather uses an algorithmic approach that is more transparent to the fund manager.

Finally, if you've got unlimited time and a very high ability to synthesize knowledge, I recommend a proven technology that is widely available. It's called the book. I'm looking forward to exploring this technology, perhaps when I retire.

Thomas H. Davenport is a professor and director of the Information Management Program at the University of Texas at Austin. He welcomes reader comments at Tdav@notes.bus.utexas.edu.

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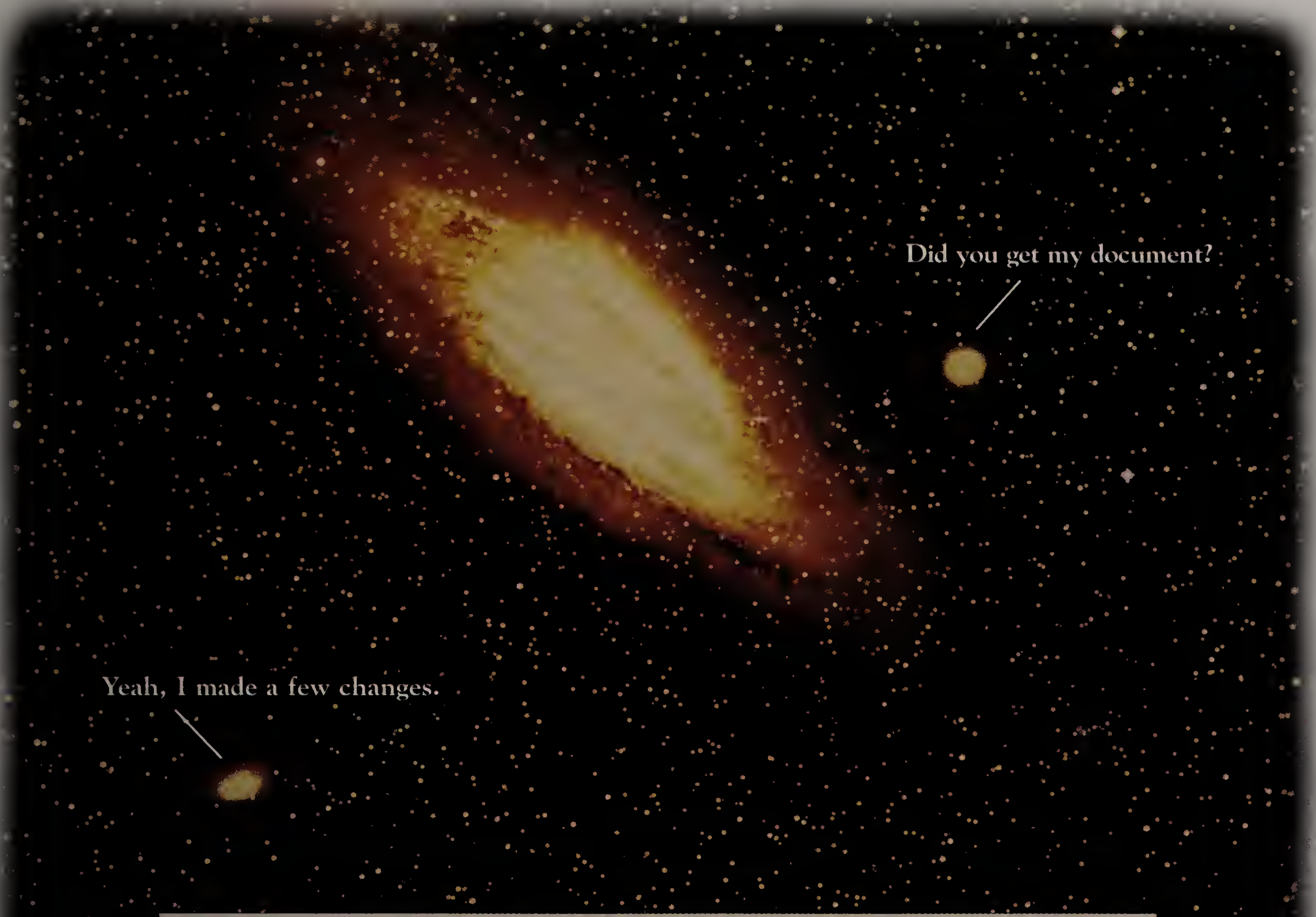
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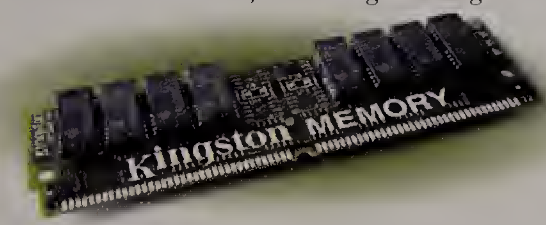

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PITCHING

CHANGE

A new CIO and a revitalized information services department are leading a cultural shift in conglomerate Delaware North

BY CAROL HILDEBRAND

Ah, the hallowed tradition of an afternoon at the ballpark. The hoarse bellow of the umpire, the crunch of peanut shells underfoot, the appetizing aroma of pan-seared scallops with a sun-dried tomato salsa... Say what?

Even in a business as hidebound as baseball, times are changing. Ballpark food vendors such as Sportservice Corp., a subsidiary of Delaware North Companies Inc. (DNC), can no longer rely solely on dwindling devotees to fill seats and stomachs; they must also capture the leisure dollars of a more fickle audience. So these days, fans at Sportservice venues, like Jacobs Field in Cleveland or the Ballpark at Arlington in Arlington, Texas, are just as likely to encounter seafood as frankfurters.

Reader ROI

IF YOU THINK MANAGING change at your company is tough, try starting a cultural revolution. That's just what the CIO of conglomerate Delaware North did. Learn from her experience profiled here:

- How to use IT to lead cultural change within the company
- How to unify the home office and line business functions
- How to integrate data collection and analysis across retail and food and beverage lines of business.

"I'm not really concerned about the technology; it's pretty easy to implement. I'm more concerned about the softer issues of training and education."
–Debra Robinson

PHOTO LEFT COURTESY OF DELAWARE NORTH COMPANIES INC., RIGHT BY GREG GILLIS

Breaking up the holy trinity of beer, peanuts and a hot dog may seem like a radical move for Sportservice, but it is a minor-league change compared with the shift in business culture its parent company is making to drive that kind of responsive marketing. DNC is nearly as traditional as baseball itself, and the corporation has increasingly found that old ways of thinking (and old IT) have hampered its ability to compete. "A number of things needed to change culturally in the company to take us to the next level of excellence," admits Richard Stephens, DNC's president and chief operating officer.

Among those things were items on many corporate to-do lists today: developing a more collaborative, information-sharing mind-set; efficiently gathering business-critical information and quickly funnelling it to people who need it; and encouraging a more creative environment. To pull off those changes, DNC decided to rely on IT—specifically, new CIO Debra Robinson, who was hired for the very reason that she was a mismatch.

"If you're trying to lead change, you [don't want someone who is] a full cultural fit," explains Peter Olsen, an industrial organizational psychologist who has worked with DNC for years. "You want somebody who's leading edge and not fully compatible." When Stephens found Robinson in July 1995, he snared a candidate who met that description. Robinson says on the pre-employment assessment test she took during the hiring process, she scored low on valuing tradition and tipped the scale on supporting change. Now Robinson, who came from Aramark Corp., a food-service competitor based in Philadelphia, is leading a companywide charge to integrate systems, which Stephens thinks will kickstart DNC into a more collaborative culture. "I could not signal that I wanted to change our culture in certain ways faster than through IT," he says.

The Old Guard

DNC IS A $1 BILLION, privately held company that operates a wide variety of businesses in the food, beverage and recreation management industry. DNC-run facilities include sports venues, airport food and retail operations, and the complete operational management of some national attractions, such as Kennedy Space Center Visitor Center and Yosemite National Park (see related story, Page 48). Each of its divisions needed to respond to the same kinds of changes in market tastes that had affected Sportservice. With this kind of market pressure, management by status quo hardly seemed prudent. Unfortunately, DNC's hierarchical management setup was not built for quick response. Many DNC executives grew up in various family businesses, hawking foodstuffs in ballpark bleachers, and they formed a tightly knit fraternity. Such tradition spawned pride, but it also discouraged stepping outside the boundaries of history and the comfortable network of good-old-boy relationships.

"I could not signal that I wanted to change our culture in certain ways faster than through IT." –*Richard Stephens*

"If you're trying to lead change, you don't want someone who is a full cultural fit; you want somebody who's leading edge and not fully compatible." –*Peter Olsen*

Moreover, there was a schism between the corporate office and the line business units. The two sides argued about whether control of certain processes should be centralized or distributed among the line units, says Jessica Rahuba, executive assistant to the office of the president. For example, all invoices were processed through the corporate office, which helped corporate accounting with its control procedures but didn't help a store in Yosemite pay its bills quickly.

As a result, although the home-office folks such as HR and finance were supposed to support the operational units, "that probably isn't what it was like [before the change project]," says Olsen. "Most folks would say, 'Yes of course, line [business units] are our customers,' but whether the customers really felt like they were satisfied is something else." What emerged, says Olsen, was a rigid company that was resistant to change.

The company's IT infrastructure—or lack thereof—only exacerbated the problem. Many of its processes, like accounting and business analysis, were done manually, and as a result, information reached executives slowly. (Remember all those

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By a WALL STREET JOURNAL *Staff Reporter*

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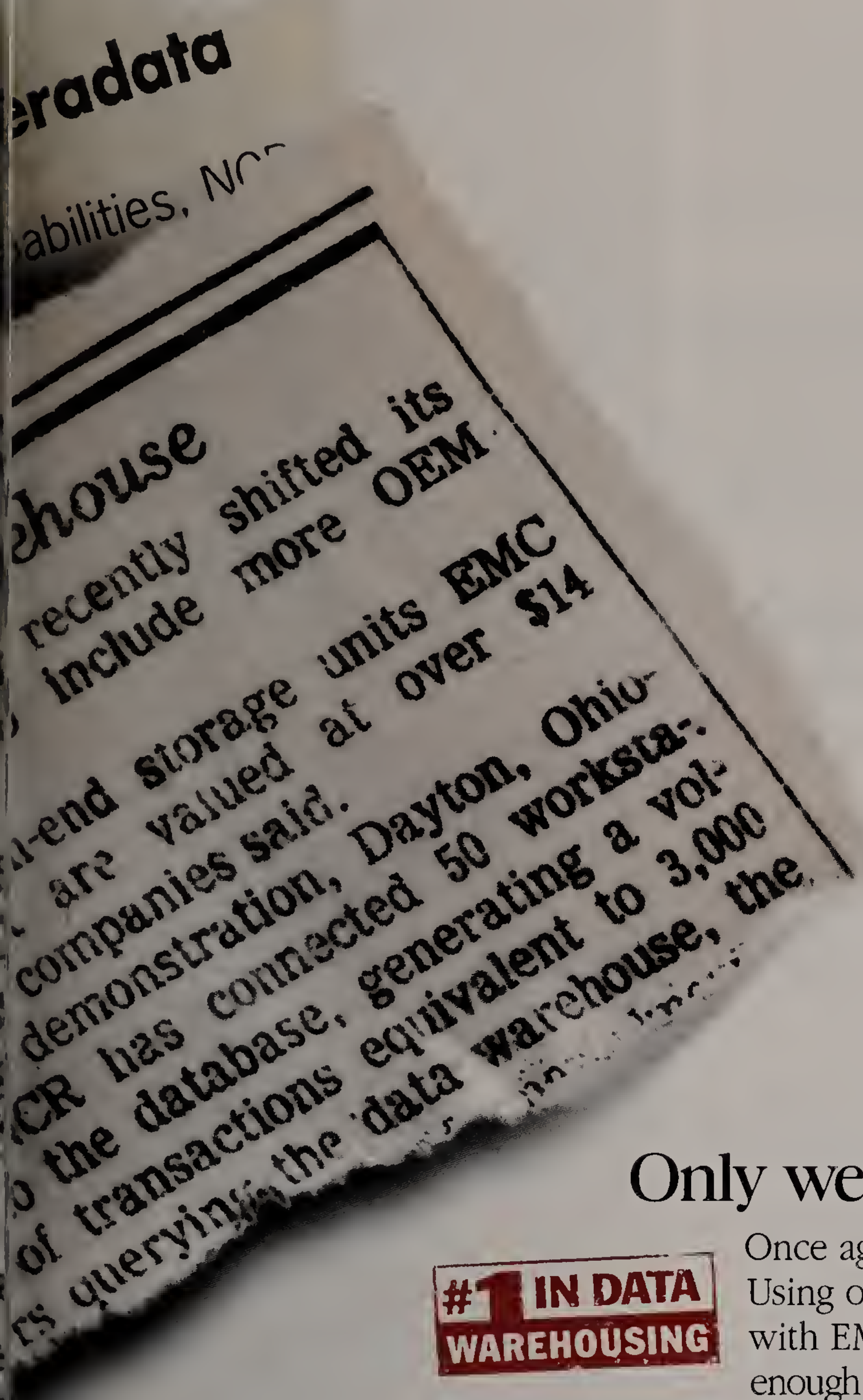
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invoices routing through corporate HQ? A clerk there filed them in wooden pigeonholes.) For DNC to compete with rivals such as Aramark, its employees first needed access to timely information about their operations—how many tickets were sold, what food sold well and where, which T-shirts were hot items—without waiting more than a week for hard-copy reports. The operational IT for the different subsidiaries was pretty decentralized, says Rahuba, who has been a point person during the change process. "We've always been good with financial systems, which is understandable, since IT reported to our financial function, but we never went out in the field and dealt with the needs of the local line management," she says. In fact, many facilities lacked systems at all. While a food vendor making change from his apron pocket may be traditional, the process is not particularly helpful in collecting point-of-sale information to analyze customer trends.

Consequently, gathering information both within and across divisions was difficult. For example, DNC's CA One Services division manages airport food service at more than 40 airports around the country. While clients such as Los Angeles and Newark airports might benefit from sharing inventory and ordering information, chances were good that if systems existed at all, they were incompatible. DNC needed ways for subsidiaries to share resources and information. "For example, we do a lot of ticketing and reservations in our parks divisions," says Rahuba. "We don't have that need in CA One and Sportservice. In Park 'n' Swap, we do have a ticketing system—but the two aren't integrated."

Revolution Begins

When Robinson started in July 1995, she knew she had to show commitment to change quickly—or risk being relegated to her predecessor's role of running the eighth-floor data center. In order for IS to lead change, the department had to first renovate itself. With Olsen's help, Robinson worked with her staff to revamp the department's roles and responsibilities to make sure that IS was capable of handling the new demands that would shortly descend (see "Psyched Out," this page). In addition, her group needed a way to gather information from each division and department to prioritize business needs. But they needed what Stephens calls a "free, unbiased flow of information," unmarred by political or turf considerations.

While Robinson knew she had to find a way to get the line business executives to share their IT needs, she didn't have the time to build trusting relationships with colleagues who were unaccustomed to considering IS a productive partner.

> **"I need analytical, objective information that lets me know both possible opportunities and places where we're getting the crap beaten out of us."**
>
> *–C.B. Vaughan*

Moreover, Stephens had given her an aggressive timetable (he wanted visible results within a year, she says). "The worst thing I could have done would be to disappear into Buffalo headquarters creating a long-term plan and have no deliverables for two years," Robinson says. "We needed to have some quick-hit successes" to show business executives that IT was a force to reckon with.

Within two weeks, Robinson convinced the division heads to convene in Houston to try an electronic brainstorming strategy called TeamFocus. (It helped that she had presidential backing. "If people didn't know that she spoke with my authority, they soon learned it," Stephens says.)

Run by a facilitator from IBM's Integrated Systems Solutions Corp., a TeamFocus session allows groups to have electronic discussions anonymously. Participants, each equipped with a laptop, sit around a table in front of a large projection screen. A facilitator asks a series of questions based on decisions that need to be made, and everyone types responses into the laptops. The unattributed responses appear on the projection screen, and the facilitator leads a discussion of the input. The

Psyched Out

IT profiles its own to support change

Before CIO Debra Robinson could use her IS folks at Delaware North Companies as change agent provocateurs, she had to teach them to accept change in their own department. Robinson's staff ranged from brand-new members like Pat Muccigrosso, the director of field services, to Dave Meacham, a 20-year DNC veteran. With the help of industrial and organizational psychologist Peter Olsen, Robinson and her four direct reports spent a day and a half comparing each other's psychological profiles.

Robinson says the process really helped them understand each other's motivations and how easily actions can be misinterpreted. For example, because of his time at the company, Meacham was more apt to respect tradition than was Robinson, "so he would take personally some [change] decisions that, for me, were purely business," she says.

It also helped them recognize that the IS department's atmosphere was open to reinvention. "I replaced a person who never went into the field," says Robinson, "whereas I travel 95 percent of the time." Moreover, the number of women on the IS executive team has risen to represent three-quarters of the team, and nearly everybody is new to the job. Robinson has also added positions, such as a retail analyst, that directly support line business functions. Those kinds of shifts are bound to change the dynamics of a department, and Jessica Rahuba, the executive assistant to the office of the president, says the change is for the better. "Before, IS never got off the eighth floor; people didn't know who they were," she says. Now it's hard to miss them.

–C. Hildebrand

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From the desk of:
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A Letter To IT Professionals,

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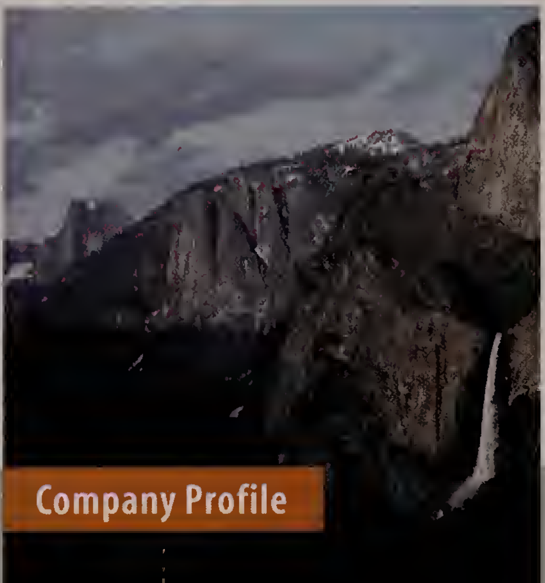

Company Profile

Delaware North Companies Inc. is made up of seven subsidiaries

Delaware North Parks Services ▶
DNPS was formed in 1992 to manage visitor services at Yosemite National Park. Since then, the company has added four contracts, including the Kennedy Space Center Visitor Center. The company's responsibilities include operation of hotels, motels, restaurants, tour services, gift shops, grocery stores, golf courses, concessions, security management, camping services, guide services and equipment rentals.

CA One Services ▶
This division is the second-largest airport food-service and retail company in the United States. It serves more than 160 million travelers at more than 40 domestic airports, including LAX and Denver International.

▲ **NBG Corp.** DNC owns the $160 million FleetCenter, the sports and entertainment successor to the Boston Garden. NBG Corp. manages and oversees all events at the FleetCenter.

group eventually votes on the top 10 goals that emerge.

The anonymity of the discussion allows participants to respond without fear of retribution, and the format can save precious time because it allows many people to "speak" at once. Finally, the approach engages everybody in activity, says Robinson. "If it was just me standing at the front of a room with a flip chart, people would get bored and leave in droves," she says.

"What we got out of this was invaluable," says Gary Fraker, president of Yosemite concession services. "It's really given us focus and clarity about IT."

Robinson also used the Houston meeting to gain senior support for the tool. She wanted to use TeamFocus companywide to prioritize each division's IT goals. The head of each division had the final call on whether to use the tool, and ultimately nearly all of them did, says Rahuba. Each session brainstormed IT needs, and the participants then drew up a list of 10 top priorities. Robinson collected several fat binders of such information and, along with the senior executives of each division, hammered out companywide priorities.

Although there were some unique needs, such as Yosemite's request for a better reservation system, Robinson says the similarities across divisions were striking. Without a doubt, the number-one priority was to get standard point-of-sale systems in place across the entire company, for both retail and food and beverage sales. Then the POS data could feed into a central data repository to be mined for the kind of informational nuggets DNC executives wanted. Currently, DNC executives receive weekly hard-copy "flash reports," or executive summaries that contain 10-day-old information. That's frustrating to executives who sometimes want more detailed information—and always want it quickly. "I need analytical, objective information that lets me know both possible opportunities and places where we're getting the crap beaten out of us," says C.B. Vaughan, vice president of retail concepts at DNC. "To do that, I need to sort the information according to how I need it. I want the global view, but if I need a microscopic view, I'd better be able to zero in."

Dennis Petrullo, vice president of baseball operations at Sportservice, agrees wholeheartedly. Since his business is seasonal—a season that lasts roughly 81 days—he needs information as quickly as possible. "If the corporate purchasing department wants to know how many bags of peanuts we've sold at our major ballparks, right now I'd have to call each ballpark and ask," he says. When this information is available online, however, "we'll be able to track these products much more easily and react to problems and successes faster."

Seeing the Softer Side

REACTING TO THIS UNANIMOUS mandate, Robinson already has started implementing pilot integrated POS systems at Kennedy Space Center and Newark International Airport. The IS department used rapid-application design to get a prototype POS system up and running within six weeks. ("Instead of talking about change, users can look at a product," says Robinson.) The front end of the system will feature IBM touch screens running software from Boca Raton, Fla.-based HSI Software, which specializes in POS software. The system will feed into Microsoft's SQL server. Robinson declined to say how much the system is projected to cost.

But Robinson has spent considerably more time thrashing out nontechnical issues. "I'm not really concerned about the technology; it's pretty easy to implement," says Robinson. "I'm more concerned about the softer issues of training and education." To that end, she's been heavily involved in the Newark and Kennedy projects, making sure IS delivers a system that employees will want to use.

For example, she says, when the Newark team brought one store online, many employees feared the system would somehow make their jobs obsolete or more difficult. Along with Olsen, Robinson and the Newark team created clearly defined roles and responsibilities for system users. They also spent a couple of days in what Robinson calls "discovery meetings," working with Newark employees to outline what they would be learning and how their jobs would change. The more they know upfront, she says, the less they worry. "Then, when we put the system in, it will be just an implementation."

Robinson also consults systems users earlier in the development process. She held TeamFocus sessions at each site, inviting a wide array of employees—the Kennedy meeting included people from landscapers to senior managers.

She created "vendor labs" that gave users a chance to test drive different vendor offerings. At Kennedy, for example, the cashiers critiqued three different systems. "It's all about managing expectations," says Robinson. "I want the customers involved in every one of the implementation and selection decisions."

Robinson can't control the larger cultural fallout that instant data accessibility eventually will bring, however. Stephens says he's concerned that individual concession-stand managers will blame integrated POS systems for a certain loss of independence. "They are afraid of what's going to happen with that data if senior executives have access to it," he says. "Right now, they have autonomy based on our ignorance." Stephens hopes that rather than produce a Big Brother atmosphere, the system will open communication channels. With better information, "I might ask more questions," he concedes. "But they'll be better questions."

Robinson and her group have a lot of ground left to plow: She plans to have the infrastructure for POS systems for retail and food and beverage systems in place by the year's end. But Stephens' choice of a change agent already has given him the shakeup he desired. Executives now recognize not only the technical power of information systems but also its ability to change the way a company works. Peter Crage, the controller at Kennedy's visitor center, says he can see changes after just 14 months of Robinson's tenure. "We've realized that IT isn't just computers and faxes; it's evolving into a communications process," he says. "It facilitates change and our ability to compete better." CIO

◀ **Sportservice Corp.** This division provides food and beverage service at sporting and recreational venues. It serves ballparks, racetracks, hockey and basketball arenas, and other sports facilities. It also operates a separate retail arm called Fan Zone.

▲ **Sportsystems Corp.** This subsidiary is the largest parimutuel operator in the country. The company owns and operates horse and greyhound racing facilities in Florida, New York and West Virginia.

▲ **Delaware North Companies International** The international division manages overseas contracts as diverse as parks management and airport concessions, including more than 100 in Australia. The company is currently expanding in the Pacific Rim.

◀ **American Park 'n' Swap** APS runs open-air markets in unused parking lots at public facilities such as convention centers, exhibition halls and racetracks. It operates in Arizona, Arkansas, Pennsylvania, South Carolina, Tennessee and Virginia.

–C. Hildebrand

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Senior Writer Carol Hildebrand can be reached at cjh@cio.com.

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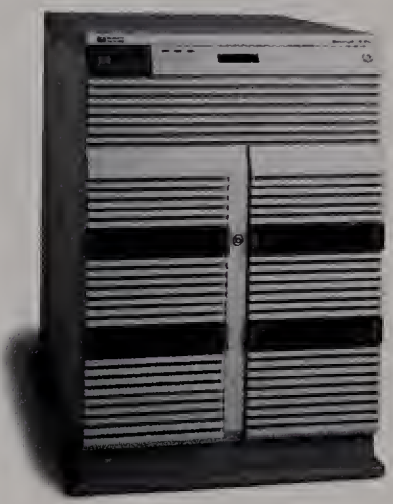

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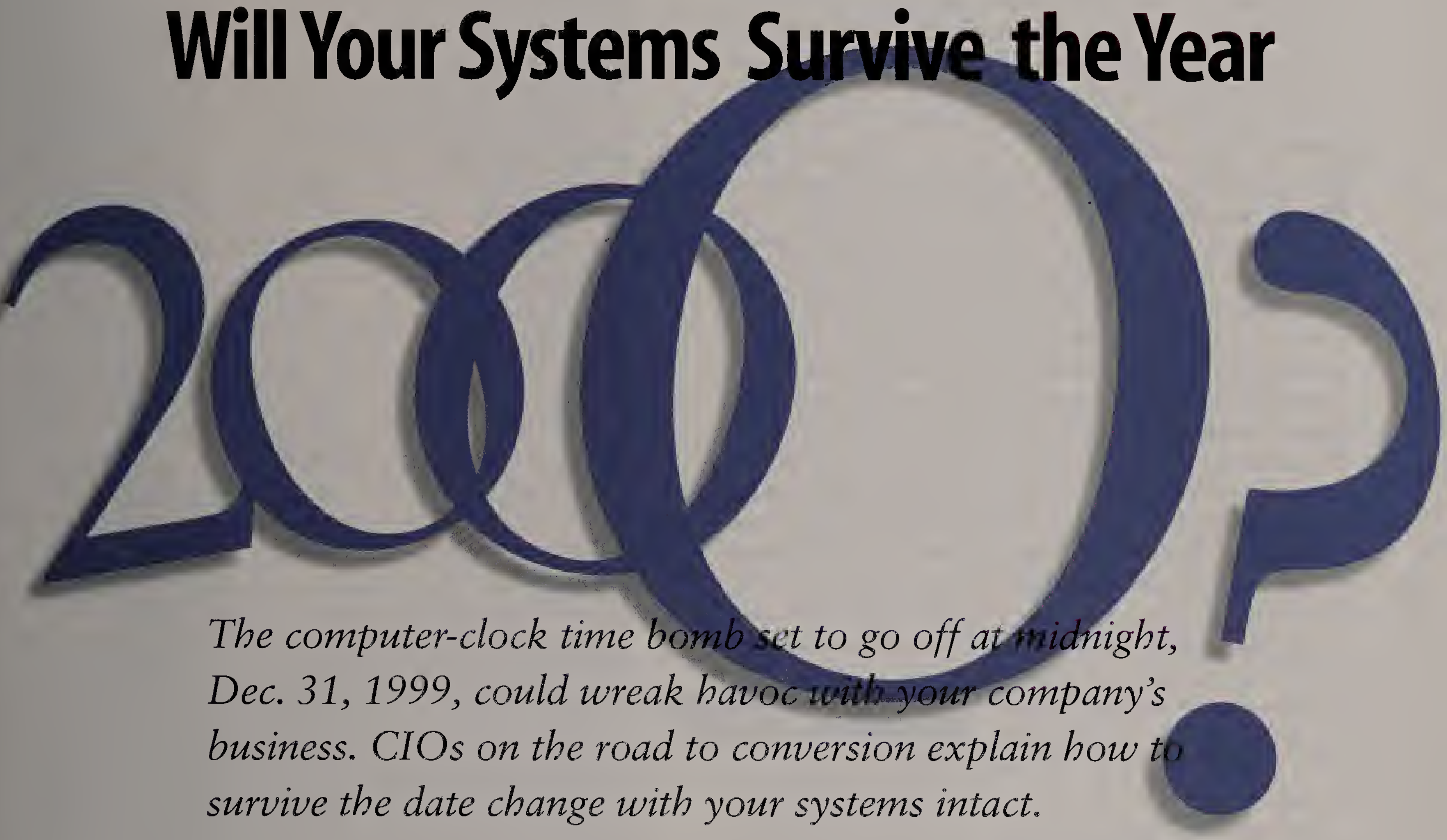

The computer-clock time bomb set to go off at midnight, Dec. 31, 1999, could wreak havoc with your company's business. CIOs on the road to conversion explain how to survive the date change with your systems intact.

BY MIRYAM WILLIAMSON

HARDLY AN I.S. EXECUTIVE TODAY is still in denial about the implications of the ticking clock that is moving us inexorably toward midnight, Dec. 31, 1999. Much has been written about the impending disaster that will befall companies whose systems treat a double zero in the date field as signifying the year 1900 rather than 2000 (see "New Year's Evil," *CIO*, Dec. 15, 1995/Jan. 1, 1996). In response, many corporate officers have turned their anger toward the IS organization and the CIO when approving the budget for a project whose ROI is measured in terms of survival, not business advancement.

The gravity of the dilemma is more than just rhetoric, says Jim Jones, managing director of the Information Management Forum, an international association of information and business executives headquartered in Atlanta. Companies that do not convert in time, he says, "are going to slowly bleed to death as their systems start to fail." Billing systems, pension plans, asset management systems and electronic data transfer are just a few examples of date-dependent applications that will either fail completely or, even worse, provide erroneous results when they try to make calculations spanning the centuries. Experts are predicting that some 20 percent of corporations will go out of business because their systems were not adapted in time. "This is one of the few computer-related issues that's actually underhyped," adds Marc Sokol, vice president of advanced technology at Computer Associates International Inc. in Islandia, N.Y.

Reader ROI

EXECUTIVES ARE FINDING it difficult to accept the millennium date-change predicament as a business problem. Many see it as a problem caused by technology and technologists. Companies vary widely in their state of readiness to perform calculations involving dates in the 21st century. The four organizations profiled here show how to deal with various issues of year 2000 preparation, including:

- The economics of the millennium conversion
- The importance of a defined and repeatable conversion process
- Why getting a late start may be a costly mistake

Corporations that have already embraced the problem have adopted a variety of strategies. Some are rewriting code modules; others are creating separate programs to perform date calcu-

PHOTO-ILLUSTRATION BY LOGAN SEALE

lations as the applications run. Still others are taking the opportunity to discard old software and replace it, often as part of a migration to a client/server architecture. But regardless of their approach, all agree that a disciplined process is what it takes to win this race.

EXECUTIVES FIND the millennium date-change predicament difficult to accept as a business problem, Jones observes. "Part of the problem is that to them it appears to have been caused by technology and the technologists," he says. Many of the systems in production today were built in the late 1960s and early '70s. Hardly anyone expected them to remain in operation for 30 or 40 years. And no one could have predicted the way price and power would move in opposite directions, making today's $2,000 computer a few orders of magnitude more powerful and cheaper than the multimillion-dollar computers sold in the late '70s. In 1965, when many of today's legacy systems were designed, the cost of mainframe disk-based data storage was nearly 4,000 times greater per unit of storage than it is today—that is, prices have fallen by 99.9 percent, says Leon A. Kappelman, assistant professor in the Business Computer IS Department at the University of North Texas in Denton and co-chair of the Society for Information Management (SIM) Year 2000 Working Group.

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Year 2000 Problem

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Noting that the practice of storing dates in a six-digit format (MMDDYY) uses 25 percent less storage space than the eight-digit date format (MMDDYYYY), Kappelman estimates that the typical organization saved more than $1 million per billion bytes of storage from 1963 to 1992, in 1992 dollars. "Factor in the benefits, and presumably the profits, generated by these unspent dollars, using a conservative 10 percent internal rate of return, and the opportunity cost per gigabyte of total storage rises to nearly 15 percent," Kappelman says. "These estimates can be doubled for date-intensive areas such as financial services. Moreover, they only concern the savings from storage costs."

From this perspective, even though millennium conversion may require significant expenditures, "it is actually a small price to pay compared with the savings a typical organization has realized from using the two-digit year approach. This is not a trivial point," Kappelman says. "It should be underscored by CIOs when they make their case to senior management."

Date-change projects are exacting affairs, requiring meticulous inspection of every application and database, looking for places where dates are represented. Each instance requires a decision as to whether the date is used in calculations. Those that are—and that includes most of them—must either be rewritten or linked to a program that will perform the calculation correctly. Missing a single date-related program or data field can cause errors that will corrupt the database, with disastrous consequences to the business.

Where millennium date-conversion projects are underway, their leaders are bringing a higher level of professionalism to the task. Those most successful have heeded the advice of the Software Engineering Institute in Pittsburgh, whose Capability Maturity Model measures IS organizations in part by the way they have documented the development process so that software professionals don't have to reinvent it for every new project. Repeatability, one of the SEI's criteria, is a common theme when year 2000 project leaders talk about their work. For example, "I'm strongly in favor of developing a consistent, repeatable process that can be automated as heavily as possible for this work, and I am pursuing that with great diligence," says Jack Rader, enterprisewide leader at Cigna Insurance Corp. in Voorhees, N.J. Adds Jim Gillespie, project manager at Yellow Technology Services, the Overland Park, Kan., IT division of Baltimore-based Yellow Transportation Co., "Like any other IS project, it's very important to have a methodology and a repeatable process. You're going to do this conversion process over and over again, in every application module that performs date calculations. With a methodology, you have the opportunity to create synergy and momentum."

Some organizations are choosing to decommission and replace older applications rather than have them stagger on into the 21st century. At Cumberland Farms Inc., a convenience store chain based in Canton, Mass., John Carroll, vice president of IS, plans to replace several financial applications "because they haven't been updated in years."

"I think a lot of success or failure is going to have to do with how much you can throw away versus what you have to go back and convert," he says. "The conversion is going to be more tedious." Cigna, too, is replacing several applications rather than upgrade them, according to Rader.

Some IS shops are renovating entire databases and rewriting software code to accommodate the four-digit year, while others are writing algorithms to compensate for the underlying applications' inadequacies. There are many options, all of them valid but one: to do nothing. Kathleen M. Adams of the U.S. Social Security Administration heads a governmental interagency task force on the date-conversion issue. She says, "I know there

PHOTO BY KATHERN LAMBERT

PROJECT SNAPSHOT

Social Security Administration

KATHLEEN M. ADAMS
Associate Commissioner for Systems Design and Development

Project started
1989

Code modules
N/A

Lines of code to be inspected
30 million

Normal IT staffing
400

Peak staffing
400

are people who think if they keep waiting, a magical tool will come along and make this stuff go away. I don't think that's going to happen."

The U.S. government is interested in more than its own conversion activities, according to Computer Associates' Sokol. "The government is aware of the effect it can have on the economy if large companies' systems begin failing in January of 2000," says Sokol, who testified before a congressional subcommittee on technology on this topic in May 1996. "One of the things that came out during the testimony was that the Securities and Exchange Commission is thinking of requiring public companies to disclose the liability they will have in fixing year 2000 transition problems," he says.

Companies vary widely in their state of readiness to perform calculations involving dates in the 21st century. The Social Security Administration has been working on date conversion since 1989. Cumberland Farms is just getting underway, a problem mitigated somewhat by the fact that all new development in the past five years has provided for four-digit years.

"Users unable to make the 1997 budget cycle will likely face 50 percent higher costs due to the market's limited supply and huge demand for year 2000 skills and resources," says Rob Schafer, program director of Europe for Stamford, Conn.-based Meta Group's Enterprise Data Center Strategies. Cobol experts, rendered all but obsolete by the enthusiasm for client/server development, are now becoming scarce as IS shops gear up for the effort.

Kappelman predicts that, if the market requires even a 10 to 15 percent increase in skilled staff, supply may not meet demand. He estimates that contract Cobol programmers will be fetching $100 per hour within a year. It seems getting a late start may turn out to be a costly mistake.

U.S. Social Security Administration

Building Awareness

THE OUTLOOK FOR YEAR 2000 compliance at the U.S. Social Security Administration is particularly rosy now after a program that does 10-year projections got in trouble in 1989. "That made us realize that the year 2000 is not that far away, and things were going to start breaking all over the place," says Kathleen M. Adams, associate commissioner for systems design and development at the agency's Baltimore headquarters.

Applications relating to Social Security are highly date-intensive, Adams explains. Early in the assessment process, analysis of a subsystem that calculates benefits revealed that 20 percent of the lines of code would be affected by the millennium change. "That was enough to make us sufficiently scared," Adams says. The agency has 30 million lines of code in production at any given time, and the IS staff typically works on developing another 20 million to 30 million lines of code.

Adams saw lack of awareness—among the agency's 400 programmers as well as management—as the first problem. Those involved in new development had to be convinced immediately to include four-digit years. The order went out to teams working on Social Security databases, which are rewritten every two years, that the new century must be accommodated. The next step was to review the data-collection process. Most input screens were already full; adding as much as a single digit to some would have forced the input forms onto a second page. Also, Adams says, "We have a client population that doesn't like to use more keystrokes than they have to." The solution was an

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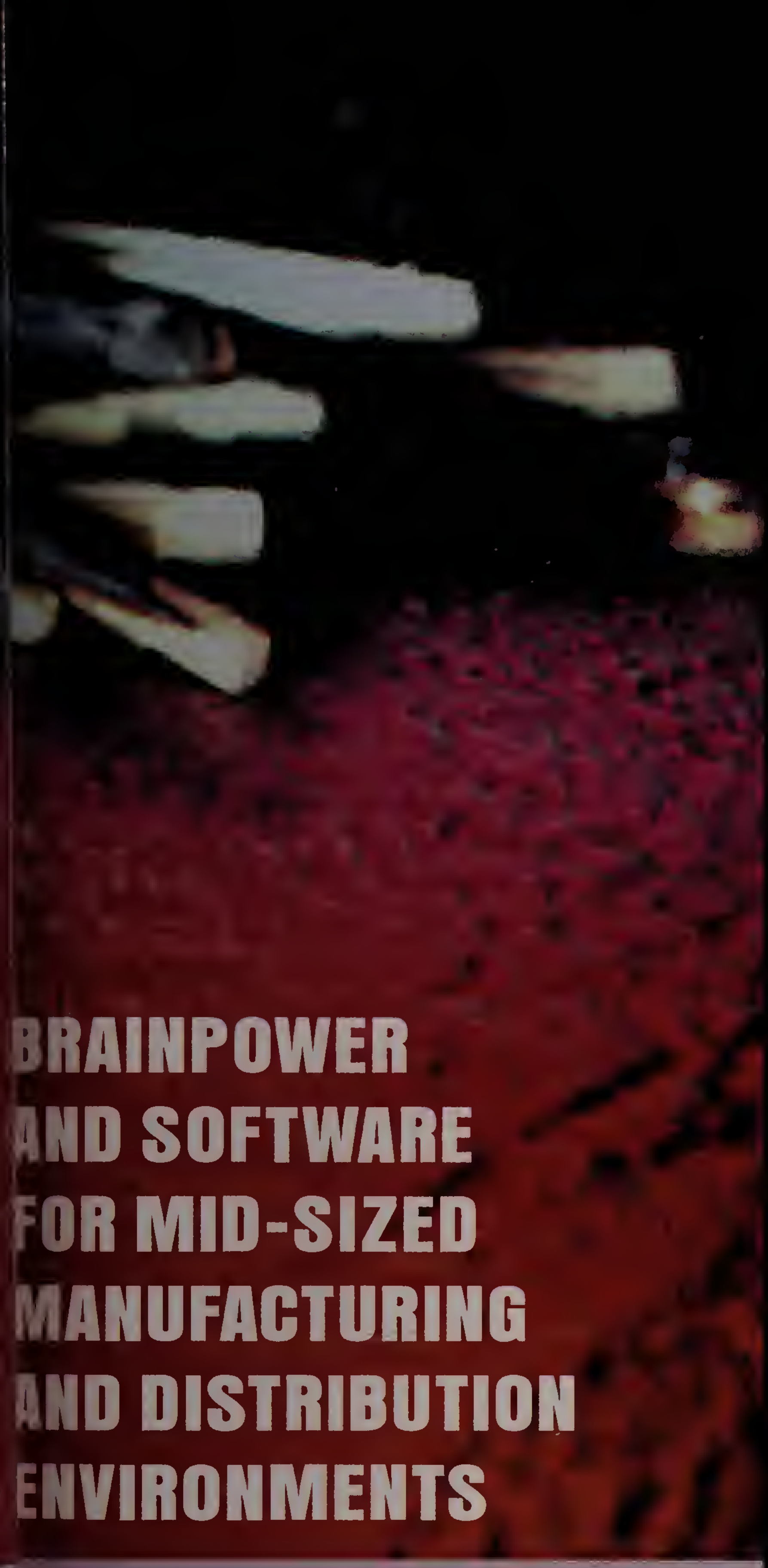

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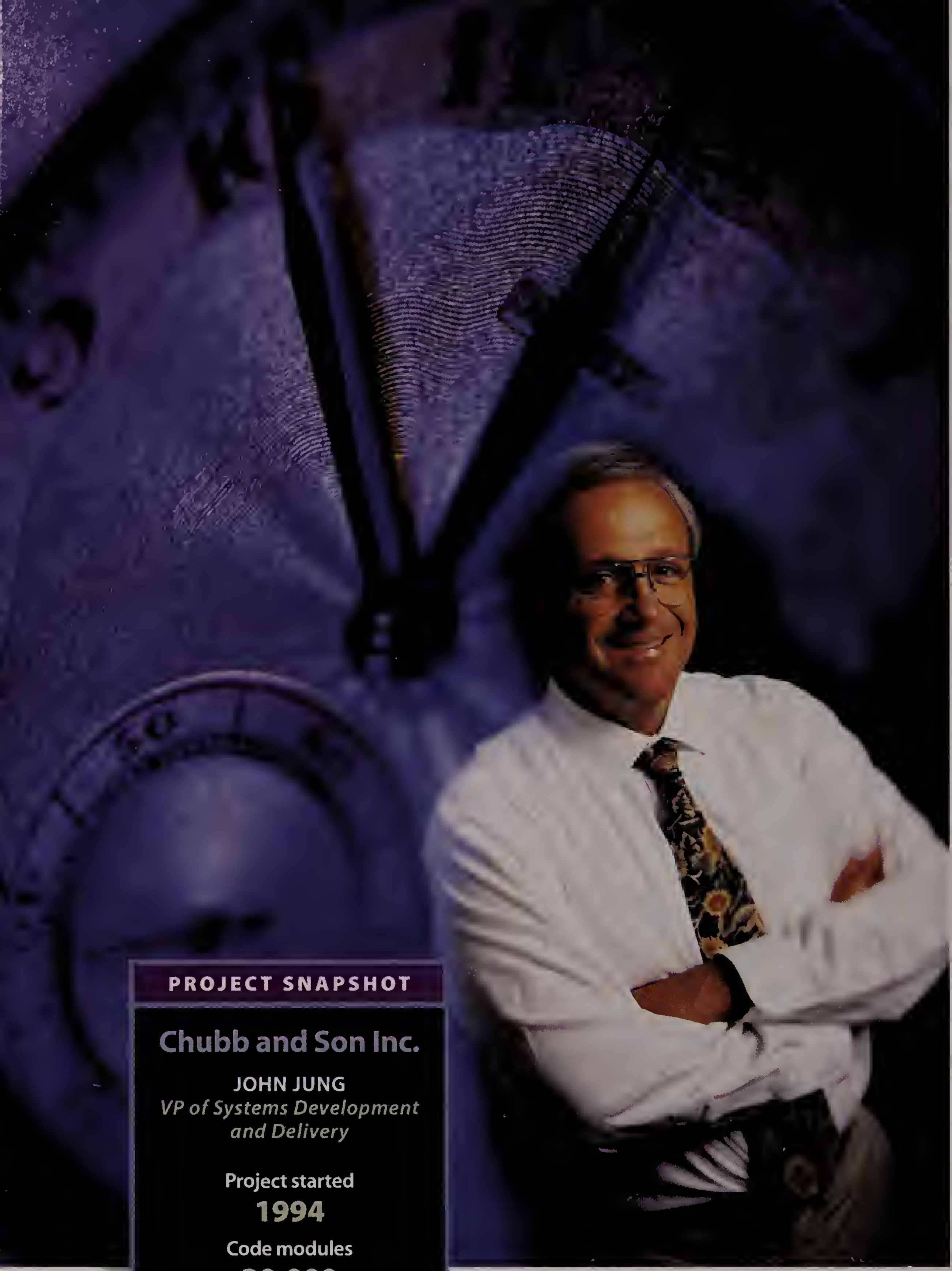


PROJECT SNAPSHOT

Chubb and Son Inc.

JOHN JUNG
VP of Systems Development and Delivery

Project started
1994

Code modules
30,000

Lines of code to be inspected
47 million

Normal IT staffing
10

Peak staffing
55-65

algorithm that translates two-digit years and converts them in the database to four digits. By June 1996, changes were complete for six million lines of code, with 24 million left to go.

Still to be done, Adams says, is an inventory of operating systems. "Most of them are not year 2000-compliant. They are all going to be upgraded," she notes. "And it's not only a matter of what you have in-house. If you exchange data with others, which we do, not only with other government agencies but with employers as well, you have to agree on how they will be giving you their data." But the real challenge, she says, will be testing. "The worst thing that can happen is if an application does the calculation but does it wrong. It would be better if it broke."

The agency's goal is nothing less than perfection, Adams says. "We send out 43 million checks each month, and we have to have as close to zero defects as we can. Even with a 1percent error rate, we'd have 430,000 people coming in or calling our district offices; so we do everything we can to avoid risk in our core functions."

Adams estimates the total effort at 300 worker years; it will be staffed entirely by SSA employees and funded out of the agency's regular budget.

Chubb and Son Inc.

Exposing the Liability

MILLENNIUM conversion is well underway at Chubb and Son Inc., an insurance company in Warren, N.J., where work on the problem began in April 1994 with a $50,000 consulting budget. The consultant and a small team of Chubb IS professionals began to count lines of code and identify each occurrence of a date that had to be changed. In the middle of August 1994, John Jung, vice president of systems development and delivery, presented the findings to Chubb's senior management team. "We didn't say we needed more money to study the problem," says Jung. "We said we have an exposure in the multiple millions of dollars and we recommend addressing this problem in a professional way, with a focused full-time team. Since I was the guy who sounded the alarm, I got the responsibility for the project full-time."

Between September and December 1994, owners of each business system, the IS staff that supported the system and a member of the conversion team discussed potential failure dates and the business side's plans for changes in the business each system supported. "We also looked at major deliverables that were coming down the road in the next 18 months that might cause us to put a particular system early or late in the renovation lineup," he says.

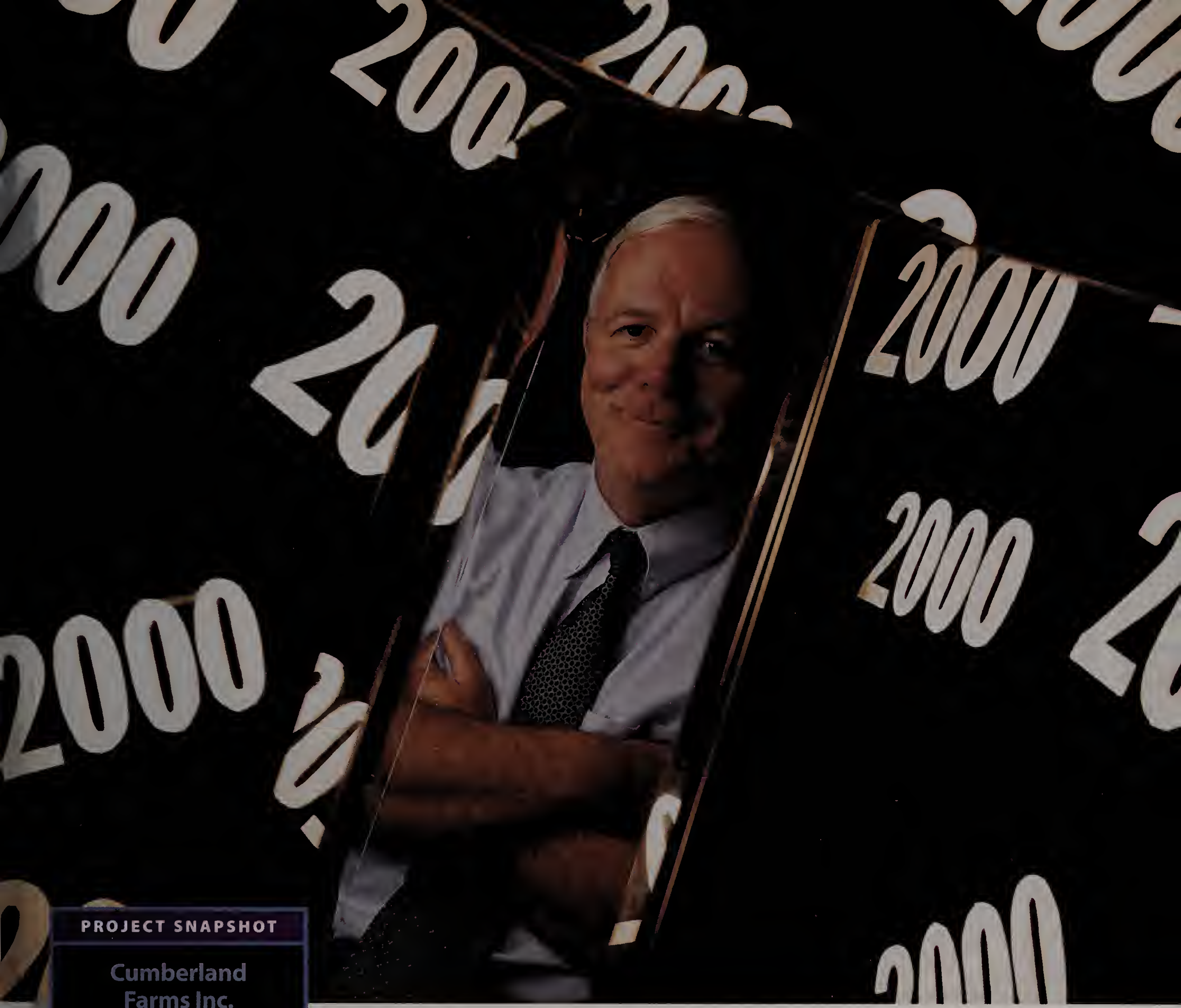
For Chubb's pilot, Jung chose a system in daily use, "in fact, one that sits at the front end of all our commercial processing." It was a high-risk undertaking, Jung says, but it was worth it. "Other companies have taken much smaller chunks for their first project and to learn the tool they have chosen. We weren't really concerned with the tool; we were concerned with the process, so we exercised the process

PHOTO LEFT BY JOHN RAE; PHOTO RIGHT BY WEBB CHAPPELL

and learned a lot. We're happy we did it that way."

The pilot was completed and the system placed in production in March 1995. "There were the usual first-week jitters, but since then it's been rock solid," Jung says. "So we had one system that's year 2000-compliant, which beat almost everyone else in the United States by one."

Work will be done by about 10 Chubb IS professionals and 45 to 55 outside contractors. By the end of March 1998, Jung says, "we will have renovated almost 30,000 Cobol programs, 130 systems and 47 million lines of code."



Cumberland Farms Inc.

Moo-ving into the 21st Century

PROJECT SNAPSHOT

Cumberland Farms Inc.

JOHN CARROLL
VP of IS

Project started
1996

Code modules
6,000

Lines of code to be inspected
N/A

Normal IT staffing
17

Peak staffing
34

FOR THE PAST FIVE YEARS, new applications at Cumberland Farms Inc. have been written to accommodate a four-digit year. That's the good news. The bad news, according to John Carroll, vice president of IS, is that most of the company's software is older than that. "We have to review 75 percent to 80 percent of our portfolio, most of it mainframe-based and mostly in Cobol. It's going to be a huge project, and our preparation for it has been only in the last year," he says.

To complicate matters, Carroll's organization is feeling the effects of several rounds of downsizing in the past few years. "You have to have people who know the applications. There are some people who either chose to leave or were let go who I wish I had back, but we're fortunate to

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have a core group of a dozen people with intimate knowledge of most of the systems," he says. Those people, working with an outside consultant and some contract workers, will carry out the review and conversion of some 6,000 modules of Cobol code. Carroll has adopted some PC-based tools from Computer Associates for the date-conversion project, giving programmers experienced in traditional technologies a chance to learn new skills while correcting problems with their old skills. He says his current staff of 17 could double at the project's peak, if he can get the funding. A pilot project, consisting of about 250 modules in a standalone mainframe system—"one of the easier ones," Carroll says—began last summer. "We're late starters," he says ruefully.

Resources

Year 2000 Home Page
www.year2000.com
Lists service providers, tool vendors, articles, events, frequently asked questions, etc.

IBM's Year 2000 Report
www.s390.ibm.com:80/stories/tran2000.html
"The Year 2000 and 2-Digit Dates: A Guide for Planning and Implementation," a 180 page report that can be downloaded from IBM's home page and contains an overview of the issue.

Year 2000 Forum
listmanager@hookup.net
An electronic forum for the Year 2000 issue; join by sending the message "subscribe year2000" in the body of the message, not the subject line, to e-mail address

Millennium Issue/ User Group
Steve Hamilton
Computer Horizons
513 769-8425
Established by Computer Horizons, this is an independent, nationwide user group with more than 50 members from large companies

"Tick, Tick, Tick: The Newsletter for Millennium Management"
800 643-8425
A quarterly, independent newsletter edited by Bill Goodwin. He is helping regional issue/user groups form; $75 for an annual subscription.

Information Technology Assn. of America (ITAA)
Deborah Head
703 284-5306
www.itaa.org
A trade association for software service providers and vendors; offers free publications such as a white paper and buyers' guide for Year 2000 tools and services

Risk Forum Internet Mailing List/Newsgroup
www.comp.risks *or*
risks-request@csl.sri.com
Topics include computer clock-related problems.

Society for Information Management Working Group on the Year 2000
312 644-6610
A forum for sharing approaches, practices, and issues in dealing with millennium issues.

Year 2000 Working Group, The Information Management Forum
770-455-0070
timf@mindspring.com. *or*
www.infomgmtforum.com
Activities to include compliance definition, project organization, work planning, tool evaluation, vendor evaluation, contracts, RFI and RFP data. Periodic face-to-face meetings and extensive Internet communication.

"Critical Issues Report: Facing the Year 2000 Problem"
Written by Leon A. Kappelman and James J. Cappel of the Information Systems Research Center at the University of North Texas, this report can be requested by calling 817 565-4698 or by e-mail at **kapp@unt.edu.**

SOURCE: LEON A. KAPPELMAN, UNIVERSITY OF NORTH TEXAS

Asked whether he expects the conversion to be complete by the end of 1999, Carroll admits he's not sure, but he is confident that the important systems will be done. He is setting priorities based on the hierarchy of important systems in the company's disaster recovery plan. "The most important systems to run the company will be the ones that we convert first," he says. "If there are some that aren't quite up to snuff on zero hour—and I'm sure there will be—it will be those that can wait."

Yellow Technology Services

Driving Force

YELLOW TECHNOLOGY SERVICES, the IT shop for Yellow Transportation Co. in Baltimore, began early in 1995 to assess the size of its year 2000 problem. "We wanted to determine if the problem was as bad as everyone was saying it would be," says Project Manager Jim Gillespie. Convinced that it represented a significant risk, the IT company budgeted for consulting services and a six-month initial project that began in February. The project, Gillespie says, had three objectives: preparing a detailed inventory and assessment of Cobol and assembler production modules; selecting, converting and implementing a production application as proof of concept; and analyzing the scope and impact of applications running on platforms other than the mainframe—on PCs, AS/400s and Unix workstations.

That project identified 58 Cobol applications, representing 165 subsystems containing 13,000 modules and 15 million lines of code. Working full time for the first three months, 10 people completed the analysis phase; 20 were allocated for the project's coding and testing phases. For the pilot application, Gillespie picked one that was large enough to be representative of the portfolio, made demands on the company's main data stores, involved both batch and CICS processing and was stable enough to withstand six months of use without being modified.

Funding so far has been relatively easy to obtain, Gillespie says. "Activities in 1995 raised the level of awareness," he says. So did an early failure of a driver's licensing system as well as "two or three other failures, all fairly small, that went a long way in helping us show why this is

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the Internet
without
getting

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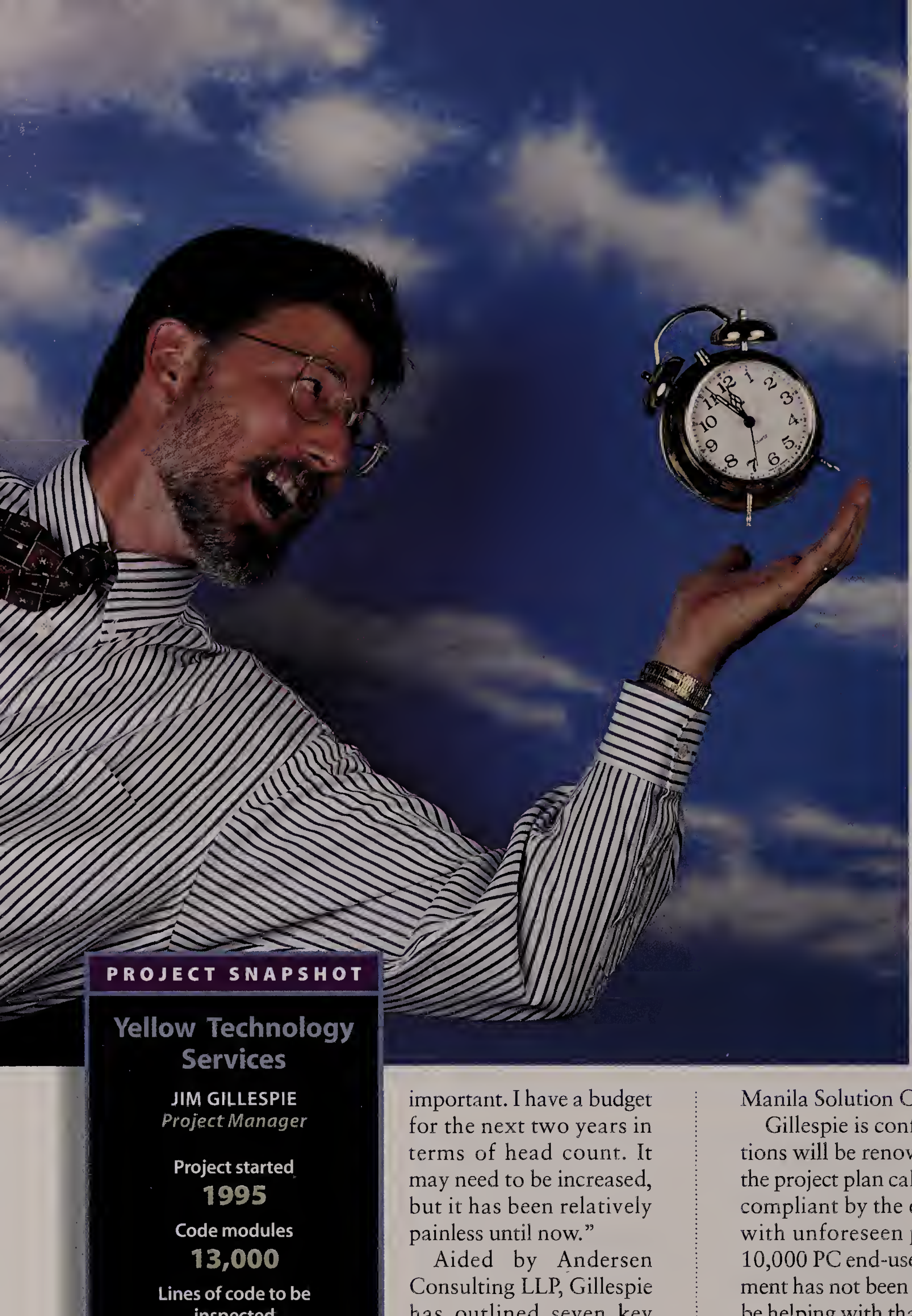

PHOTO BY MARC BERLOW

PROJECT SNAPSHOT

Yellow Technology Services

JIM GILLESPIE
Project Manager

Project started
1995

Code modules
13,000

Lines of code to be inspected
15 million

Normal IT staffing
10

Peak staffing
20

important. I have a budget for the next two years in terms of head count. It may need to be increased, but it has been relatively painless until now."

Aided by Andersen Consulting LLP, Gillespie has outlined seven key tasks that he expects will be completed by the end of 1998. A complete inventory analysis comes first, followed by a determination of the probable failure date and the severity of the failure for each module. The third stage involves analyzing third-party software and data interfaces, including Yellow's extensive use of electronic data interchange (EDI) with its customers. Resource assessment comes next, including hardware resources and software tools as well as staffing.

Design rules and compliance standards must be established, Gillespie notes. "The rest of the development staff is writing new programs and enhancing existing ones, so we need rules on what it takes to be compliant to avoid having to go back and repair what they are doing now."

By the end of the pilot phase, systems programmers at Yellow Technology will have developed a battery of tests to see the company through the rest of the project. Drawing on experience with the pilot project, Gillespie will revisit work and effort estimates and confer with the steering committee to solidify plans for the remaining conversions. While it is too early for firm estimates, Gillespie is guessing the entire conversion will consume 30,000 to 40,000 workdays. Some of the programming will be done at Andersen's Manila Solution Center in the Philippines.

> *Most I.S. executives agree with consultants that the case for concentration on date-change conversion has not been overstated.*

Gillespie is confident that all of Yellow's core applications will be renovated by the end of the century. Indeed, the project plan calls for having all applications year 2000-compliant by the end of 1998, leaving a full year to deal with unforeseen problems. He's not as sure about the 10,000 PC end-user applications, for which the IS department has not been responsible, but some of the IS staff will be helping with that effort, too. Gillespie says, "We should be in a good position to enter the year 2000 safely."

Most IS executives, generally a skeptical lot when talk turns to the pronouncements of consultants, agree this time that the case for concentration on date-change conversion has not been overstated. When asked his advice to CIOs whose organizations haven't yet addressed this task, Chubb's Jung has some strong words. "Update your resume," he says. "You can't outsource this problem. It's going to take a plan, people who understand how your systems work, a strategy and a repeatable methodology. Unless you've got all that in place, you're not going to handle this problem in the course of normal maintenance. It's not going to go away."

Contributing Editor Miryam (Mickey) Williamson can be reached at mwilliamson@reporters.net.

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company is on
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will a fancy
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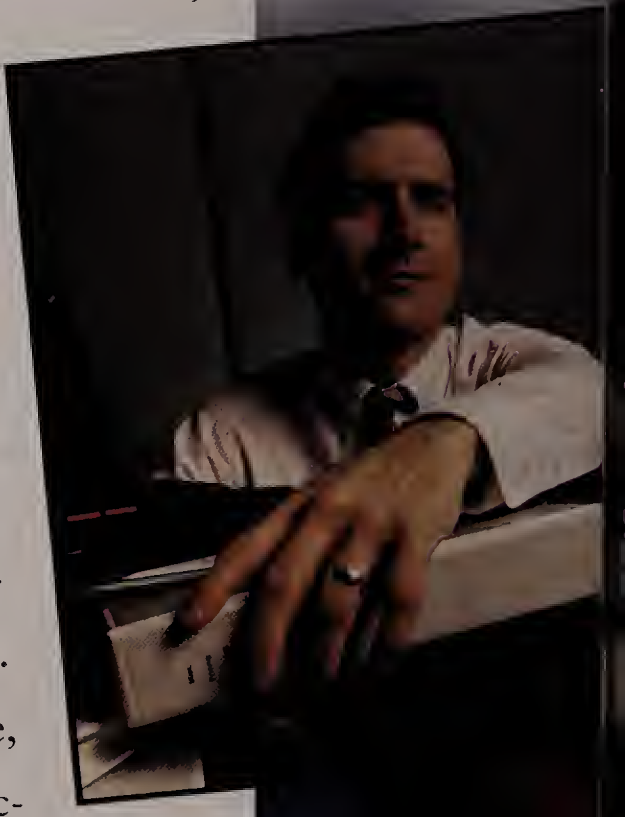
Covering New Terr

Developed to make sales reps more efficient, sales technology has changed not just the sales process but the entire enterprise focus

BY TOM FIELD

IT'S CALLED THE "SALES CYCLE," but until recently, customers of Eastman Kodak Co.'s Office Imaging unit saw something more akin to a sales treadmill: a lot of activity but little forward progress.

The wheel-spinning began with Kodak's 680 U.S. sales representatives, who dragged thick product catalogs to customer visits. Transcribing scads of customer data, the sales reps retreated to their offices, from which they emerged days or even weeks later with a sales proposal. If successful, an eight-page order form (with carbons) was hand-drafted and mailed to the company's Rochester, N.Y., headquarters, where it was entered into Kodak's automated ordering system by a team of 100 customer account administrators. More often than acceptable, the orders were entered inaccurately, and the customers were left to watch the running-in-place again.



Reader ROI

SALES-FORCE AUTOMATION IS OUT; customer asset management is in. Through reengineering and new technology, enterprises are integrating sales with other business functions to create a customer-centric organization that's responsive to market and competitive forces. This feature looks at the transformed sales process and its emphasis on maximum efficiency and improved customer relations.

ory

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A Marriage Made in Heaven: *ANB's Alexandra Scoulos focused on "relationship management" with customers.*

Hardly the stuff of a "Kodak moment."

"It was a nightmare," says Francesca Roth, Kodak's Chicago-based legal account manager. "I just kept hoping there'd be a better way." Help was on the horizon. As it turned out, Kodak's custom-built sales IT strategy—dubbed the Horizon Project—was rolled out in 1994. It equipped the company's mobile reps with IBM ThinkPads, which gave them easy access to product catalogs, price lists and competitive information. Now sales proposals can be turned around in a day, and orders are transmitted electronically. "We've cut the order time and the amount of grief and hassle a customer has to go through," says Paul Hussey, Kodak's manager of sales-force automation for office imaging. "Our customer satisfaction numbers are at the highest levels they've ever been."

Therein lies the ROI from IT in sales, where business-process reengineering and evolving technologies such as client/server applications, multimedia display and electronic data interchange have helped create a more customer-centric sales model. Overseeing it all is the CIO, who must provide sales teams with the tools necessary for companies to live by the motto to which they've always paid lip service: The customer is king.

In a world of drive-through restaurants, just in time manufacturing and overnight delivery, today's customer demands fast, effective service. And there's no doubt about it: The customer is driving the new sales model. Businesses realize that increasingly complex product lines and shorter life cycles force salespeople to rely on more sophisticated tools just to understand a company's products. "We don't have the luxury of saying, 'This is how we sell,'" says George Colombo, a Winter Springs, Fla.-based consultant and author of *Sales Force Automation* (McGraw-Hill Inc., 1994). "We exist in an environment where customers tell us, 'This is how we buy.'"

CAM Do

SALES-FORCE AUTOMATION (SFA), a common phrase that describes IT in sales, originated in the late '80s with contract-management tools such as Symantec Corp.'s ACT products, which focused mainly on the relationship between sales representative and sales management. SFA is quickly being replaced by such concepts as "total sales quality" and "technology-enabled selling." But the most frequent reference these days is to customer asset management (CAM), which describes the new customer-centric focus. Whatever term is used, IT in sales is being defined by new, technology-enhanced techniques like team selling, opportunity management and multimedia presentations.

By using IT to improve the entire customer/supplier relationship, CAM calls for integrating marketing, sales, customer service and other business information systems so that all customer-related data can be tracked seamlessly throughout the sales cycle. Ideally, this system gives users—and by extension, their customers—a single interface to answer any question about a client account.

The technical backbone of a CAM system is a data warehouse, into which businesses plug all relevant customer data, forming a client/server information system with which any user can track customer interactions (look for *CIO*'s upcoming Oct. 1, 1996, special issue on data warehousing). Remote users can be wired to the CAM system through a LAN, WAN or Internet connections.

American National Bank and Trust Co. in Chicago, a subsidiary of First Chicago NBD that sells commercial banking services to mid-market businesses, recently introduced a CAM application to better serve its growing Chicago area customer base by managing information from its 350 mobile sales reps. ANB partnered with KPMG Peat Marwick, using software developed by Salesoft Inc. in Columbus, Ohio, to create Mobile Solutions for Banking, an account management system that lets ANB's remote sales reps connect with the bank's legacy data silos to access current client and product information related to the bank's credit, cash management and private banking services.

> **"Salespeople love this stuff. I always hear, 'I customized it in the car just before I went in the door.'"**
>
> *–George Colombo*

ANB's application provides bank managers with timely access to real-time sales data from the customer account pipeline, or what's commonly referred to as "pipeline management." But "relationship management" was ANB's true objective, says Assistant Vice President Alexandra Scoulas, who adds that the company was able to achieve a stronger relationship with customers at each level of the interaction. Sales reps now have

TOP PHOTO BY MARC BERLOW, RIGHT BY STEVEN BENSON, PREVIOUS PAGE BY MARC BERLOW; INSET BY FOREST MCMULLIN

Westward Ho!

The sales automation frontier really can be settled, but the trail can be rugged without the help of an experienced guide

By Bill Kinsman, David O'Brien and Daniel Kallman

SALES AUTOMATION TERRITORY has long been a wilderness when it comes to applying information technology to increase business efficiency and effectiveness. And it's easy to see why. Sales has been populated by rugged individualists who have achieved success by being quick on the draw and shooting from the hip. But with benefits such as better communications and customer service, a more skilled sales force and increased profitability, there's no doubt that there's "gold in them there hills."

Our first attempt at automating Steelcase Inc.'s field sales force was tough going: We tried to accomplish too many things at once. Executive management was hesitant but decided to forge ahead down a path that relied on planning and testing and was dedicated to addressing the tangible needs of the field sales organization.

We now have two major automated sales tools, another in its first phases of implementation and two others in development. The results thus far: better access to corporate, customer and sales information, more informed decision making and, best of all, measurable profit improvement.

Here are 10 steps that contributed to our success:

1. Start with the process.

The sales process may be the most complicated of your company's key operations. It begins with the customer, touches every other function throughout the company and ends back with the customer. Knowing its strengths and weaknesses is critical. You are almost guaranteed to fail if you're automating a bad process. And don't forget the supporting processes such as pricing and order entry or fulfillment. Your sales automation project will have a greater chance of surviving the "change management" gantlet if it solves the disconnects that often occur between processes.

2. Form partnerships from within.

Wherever possible, garner cross-functional support. Make partners within other functions in your organization who can benefit from changes made in the name of sales automation. If you ever find yourself in a budget and resource battle, you will appreciate having them on your side. Ultimately, sales automation projects need executive approval, if not active support, which will be far easier to gain if you can identify benefits across corporate lines.

3. Get sales in the game.

One thing that surely can sap the enthusiasm of a sales automation project is the "not invented here" syndrome. Sales must own sales automation. They should fund it with their budget dollars and resources. While technical development requires IS management, overall management of the project should be the responsibility of one person in the sales organization. At the very least, make sales a part of your development team. Use strong sales reps to build your conceptual design and data requirements, validate the direction and value of your product and verify that your implementation process will be accepted.

4. From small sparks big flames come.

It can take months, even years, before big financial returns can be realized from a sales automation project. But many short-term benefits can kindle a bigger fire. Small improvements will help build momentum and enthusiasm for your ultimate goals. In our project, for example, we developed a small technical reporting link that allowed our business research function to give executive management sales information they had been unable to access.

5. Use corporate IS to manage technical development.

Avoid the temptation of turning over control to big consulting firms that promise everything—they may not have the local experience to work through delicate relationship issues. Instead, use corporate IS personnel to manage technical development and team them with an overall project manager from sales.

6. Sell the sizzle; eat the steak.

Clear communication is your strongest lever when it comes to moving change management in a positive direction. We developed a comprehensive communication plan segmenting our audience and targeting the appropriate message and medium for each audience. To address managers, we used hard-copy business plans and personal presentations. For user groups, we used direct e-mail and group presentations. For team and cross-

Continued on page 70

Blazing The Trail: *(from left) Steelcase's Daniel Kallman, David O'Brien and Bill Kinsman.*

Continued from page 69

functional communication, we used electronic bulletin boards and a variety of small group presentations. You'll want to incorporate every available means to distribute information to both broad and specific audiences, including employee newsletters, large group presentations and functional presentations.

7. Assign a task master.

Use a project management tool, such as Microsoft Project, to document and track broad activities and related detailed tasks. Taking the time and discipline to document activities and bring tasks down a level or two is not only good for planning and scheduling, but the output reports are excellent communication tools for setting expectations. If you can outline all the steps in the process, identify who's going to take each one and predict how long each will take to complete, it is easier to explain to an impatient executive group why your account management software will take six months to design.

8. Plan on training, more training and intensive training.

You'll probably be investing more dollars per salesperson on training than you will on software development, so it's wise to consider training carefully. Most likely, your sales organization will have a broad range of computer expertise. Your training program will need to allow for experience, ranging from those who have never touched a keyboard to those who are extremely application-literate.

9. Nurture adaptability.

It will take plenty of innovation and flexibility to keep your momentum going on the sales automation trail. We found that by adopting the entrepreneurial spirit, our team approached problems creatively and always looked for continuous improvement opportunities. That approach, known as "intrapreneuring," is based on sharing information freely, recognizing individual and group effort and being confident in your goal. By being intrapreneurial, we quickly adapted to forces out of the team's control yet stayed focused on achieving our primary objectives.

10. Build a business case.

The key to achieving and maintaining support for a project is having a solid business case that stresses achievable return on investment. If you examine your sales process, you're likely to find real opportunities for profit improvement. Use the business case to outline those opportunities and document how your project addresses them to make a positive financial impact on the company's bottom line. Treat it as an official document. You'll find it will win greater acceptance if it is well-organized and highlights key issues upfront.

Include all your project management task plans, budget outlines, resource requirements and schedules as addenda to the plan. Refer to the business case in your presentations and update it regularly as you accomplish goals, modify scope definition and adjust your plans.

Bill Kinsman, David O'Brien and Daniel Kallman make up a management team that oversees the design, development and implementation of a sales automation tool portfolio for Steelcase Inc. in Grand Rapids, Mich.

greater access to current product and customer information, management sees more timely sales data for forecasting and customers can make a single phone call to get answers about their accounts.

There were some unexpected challenges to implementing this system—mostly with training. But there were also unexpected benefits, such as greater ability to cross-sell ANB's services to existing and new customers. In addition, ANB avoided the problems suffered when longtime sales staff leave a company, taking their client lists and account histories with them. With this new sales system, that information can be stored and used to help train new sales reps via "electronic mentoring."

But the greatest benefit of any CAM system is to the customer. "From the customer's point of view, customer asset management creates a seamless interface with the whole organization," says Mary Coleman, president of Santa Clara, Calif.-based Aurum Software. "Each time the customer and the company make contact, they build equity in the relationship. The result is better customer service and a long-term relationship that gains value over time," she says. The customer can call an ANB representative who in turn, with a couple of keystrokes, can get any information about the account. The customer need never hear, "I'll have to get back to you," or "You need to speak to someone else."

DREAM TEAM

THE MODERN SALES team is divided into several independent components: tele-sales, outside sales, electronic kiosks and the Internet. Through client/server software, local and wide area networks as well as company intranets, enterprises not only can link all members of the sales team to a common information system, they also can integrate information from such disparate business functions as engineering and customer service to give salespeople more information to share with customers. And by integrating with third-party selling partners such as brokers and wholesalers, companies can achieve a new state of "virtual team selling."

Before IT, team selling was more of a dream than a reality, says Phil Tamminga, partner and director of the sales force effectiveness practice at Andersen Consulting. "It required a lot of meetings, memos, conference calls," Tamminga says. "Now there is more customized information that is easily available to the salesperson, which encourages better team selling." Because team members can be connected through groupware and intranets to work with the same information concurrently, meetings and memos are easier to manage, especially over distance..

Interleaf Inc., a Waltham, Mass.-based vendor of document management software, has created a new team selling model with its Intellecte/Sales Team, which Interleaf's sales representatives both sell and use. Developed with Avondale, Pa.-based business unit The Learning Alliance, Intellecte/ Sales Team allows remote users to plug into a corporate intranet and interact with document

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repositories to share real-time data about sales leads, product pricing, specifications and availability. A marketing encyclopedia—a database of brochures, company profiles, testimonials and other presentation material—also is accessible. Interleaf's 70-member U.S. sales force is divided into inside sales, sales consultants and account executives who all play different roles in the sales cycle. Intellecte/Sales Team allows all members of the sales team to share the same data among themselves and with managers at headquarters. "It's given us a good framework and steps to follow," says John Hess, a Detroit-based account executive. "It's crystallized the sales cycle for us."

"Spray and pray" was the old sales approach—blitz a cold audience with direct mail and sales calls and hope that a few prospects bit. Now, through opportunity management systems—databases in which sales teams log and qualify potential customers—sales departments can track their leads and identify opportunities by isolating and concentrating on the customers who are most likely to buy.

Interleaf's Intellecte/Sales Team system, for example, forces reps to ask and answer a series of prospect-qualifying questions at each step of the sales cycle, like "What is the business problem this project is trying to solve?" and "To which political forces must the project recommendation be sensitive?" With the answers, customer and sales team alike can rely on evidence rather than instinct to decide whether the relationship is worth pursuing. "I'm definitely asking harder questions of my customers, and the answers I'm getting back are really helping," says Hess.

As with ANB's new sales system, Interleaf's Intellecte/Sales Team presented training challenges to the sales staff, says David Allman, general manager and founder of The Learning Alliance. But of those who survived the switch, they've discovered the greatest efficiency of opportunity management: devoting more effort to strong prospects, less to weaker ones. "They're not making more good calls," Allman says, "but fewer bad ones."

SPECIAL DELIVERIES

When McDonnell Douglas Helicopter Systems in Mesa, Ariz., sells helicopters (see "Birds on a Wire," *CIO*, Feb. 1, 1996), its salespeople present customers with a multimedia proposal of video, animation and graphics to demonstrate a "virtual helicopter." Not all successful SFA presentations are that slick, but they do allow sales reps to produce more impressive sales proposals.

"Salespeople love this stuff," says Colombo.

Whither the Web?

As enterprises integrate IT into their sales processes, many wonder what impact the Internet will have on the traditional sales process—and the salesperson.

PHOTO BY KENT HANSEN

Move Over, NBC: *Netscape's Larry Geisel compares today's Internet use with the early days of TV when actors would stand before the camera and read radio scripts.*

"It's gotten so that if you're not talking Web, you're not talking," says N. Lee White, partner in charge of the strategic sales integration practice at KPMG Peat Marwick. But that doesn't mean people necessarily are saying the same things. Tom Siebel, CEO of Siebel Systems Inc. and author of *Virtual Selling* (Free Press, 1996), sees the Web as a medium that might displace traditional sales. "It's not about people looking at catalogs," Siebel says. "You're going to see people using software agents to help them shop on the Web. We'll be doing that—and doing that big."

Maybe so, says Barton Goldenberg, president of Information Management Systems, a sales technology consultancy in Washington. "The Internet will mean a lot, but not as quickly as everyone thinks," says Goldenberg. "It's a communication channel, but we have to remember that 95 percent of people don't live in this [Internet] world; it's weird stuff to them. To overhype the Internet is dangerous."

One of the pioneers of Net sales is Netscape Communications Corp., the world's leading provider of Internet navigational software. Although the company is barely a year old, Netscape's customers already number in the tens of millions. To serve them, it offers its electronic "general store," where customers can point and click their way through a catalog of offerings. After filling out personal and payment information, customers can make a purchase and download the software by themselves.

Although Larry Geisel, CIO and senior vice president of IS for Netscape, likens current use of the Internet to the early days of TV, he envisions a future when companies will leverage the Net as a sales option—particularly for such high-volume, low-cost items as consumer goods and home entertainment products. "It's certainly not going to replace all salespeople," Geisel says. "But it does put us in the position to use the salesperson in a different way."

"It's an alternative channel," says Mary Coleman, president and CEO of Aurum Software in Santa Clara, Calif., which developed SalesTrak and WebTrak applications to enable companies to incorporate Web-generated sales leads into their traditional sales and marketing processes. "The Internet won't necessarily displace what sales reps are doing. But it will increase the flow of information—just jump across global boundaries—and give them greater access to information."

Therein lies one of the challenges of Internet sales. To function globally, companies must get used to handling multiple languages, multiple currencies and mega-multiple remote users. Says Siebel, "The world has never seen an IT problem this big before." *–T. Field*

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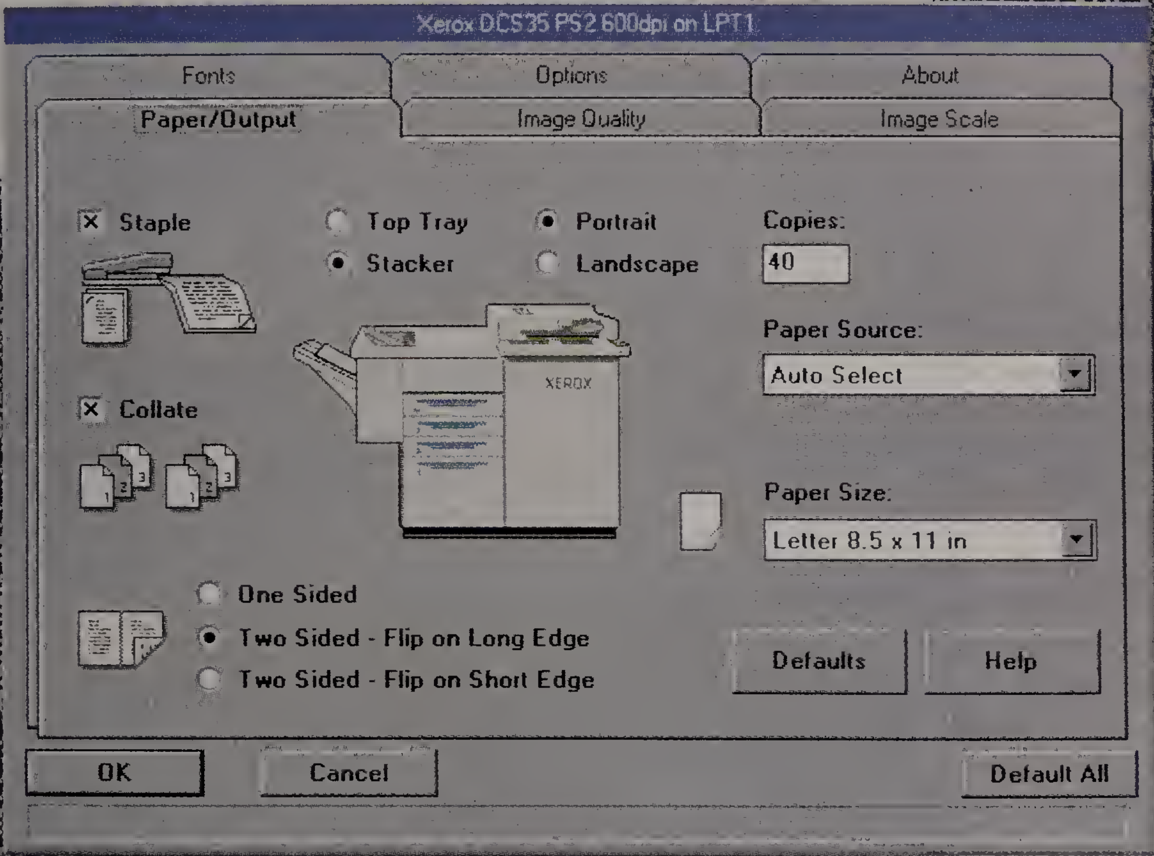

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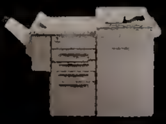

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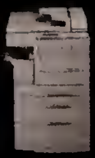

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With graphics, audio and video, sales reps not only put on a good show, they often customize general presentations quickly to meet a customer's specific needs. "I always hear, 'I customized it in the car just before I went in the door,'" he says.

Titleist & Footjoy Worldwide, the Fairhaven, Mass.-based supplier of premium golf balls, clubs and footwear, recently rolled out its Ordering and Sales Information System (Oasis), developed with Lexington, Mass.-based Waterfield Technology Group, which allows salespeople to customize presentations and place orders on the spot at any of the 14,500 pro shops and retail outlets nationwide.

> **"I'm definitely asking harder questions of my customers, and the answers I'm getting back are really helping."**
>
> *–John Hess*

Field Sales Manager and Project Leader Mike McCampbell estimates that Oasis has helped trim two days from the sales cycle, and he is extremely impressed with its presentation qualities. Before Oasis, sales reps had to prepare sales presentations over a number of hours; now they can do it in the customer's office or pro shop. With just a few keystrokes, a sales rep can use an IBM ThinkPad to call up current information on inventory, account history and even credit (which shows up in subtle ways, so as not to embarrass onlooking customers) from an AS/400 mainframe back at the home office. Oasis not only makes Titleist & Footjoy sales reps more effective and efficient, it also impresses the customers. "Part of it is image," McCampbell says. "Our customers look to us to lead on all fronts and this includes information technology and customer service."

CHALLENGING TIMES

OF THE MANY POTENTIAL speed bumps on the road to technological innovation, three of the largest are these: successfully selling the sales force on a new system, training, and distinguishing between necessary technology and needless gizmos.

The cliché advice is to give salespeople "ownership" of an IT system—tailor it to their desires and heed their feedback during testing. But that isn't enough. To be successful, system developers must involve salespeople at the design stage. When Titleist & Footjoy first conceived Oasis, MIS Project Manager Joanne Kiesel invited salespeople to the initial joint application design sessions, "not because we didn't know how to roll out an order entry system," Kiesel says, "but because we didn't know how to roll it out to them."

Trained to be independent, salespeople can be reluctant to embrace any system that pushes conformity. One way to sway them to a new system is to build in "wins." "Make it clear to them that good things can happen if they learn to use the application correctly," says Colombo, citing one company that includes an electronic expense report in its system so that reps can file reports via computer and receive expense checks in three days as opposed to three weeks.

Training is equally vital. IS and sales executives must offer adequate training to their employees upfront—Eastman Kodak gave its reps two weeks of schooling—and also must staff sufficient help desks to meet users' needs. "The sales rep who is on the road checking into a hotel at 11 p.m. is the one who is going to need the help," Colombo says. "That person needs adequate training on the system and a seven-day, 24-hour help desk back at the home office."

The technology issue also is multitiered. The key, says Barton Goldenberg, president of Information Management Systems, a consultancy in Washington, is to realize that "90 percent of the success is not the technology. The CIO must understand the business reason for SFA and help bridge the gap between IS and sales." To do that, he says, the CIO must become part of a communications "triangle" that includes IS, management and end users.

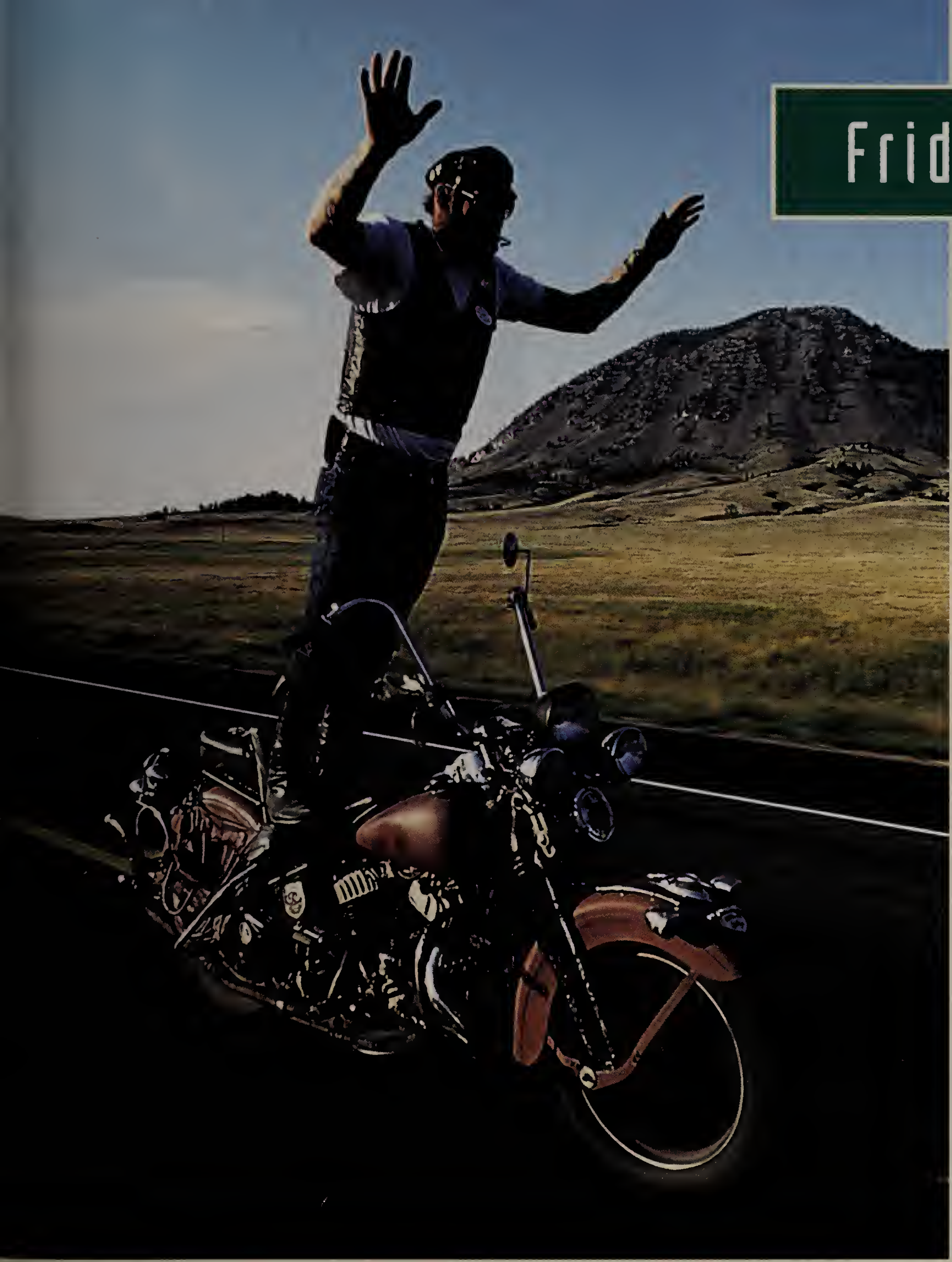
Then there is implementation cost, which varies depending partly on whether you buy or build. International Data Corp., a sister company to CIO, estimated in a 1994 study that the average first-year investment for a sales technology system is $6,400 per user. Some analysts, like Goldenberg, find that estimate high, but all agree that whatever the cost, a significant portion of the expense must be set aside for training and the project must be subjected to rigid ROI standards. "These systems have to cost-justify themselves," says Colombo, "and demonstrate that they are a better allocation of resources than other things you could do with your money."

Leader Board: *Titleist and Footjoy's Mike McCampbell keeps the sales force ahead of the game with cutting-edge IT and customer service.*

PHOTO BY ED QUINN

Beyond the purchase, the most important decision a CIO makes is which vendors to partner with. According to KPMG's White, 400 to 500 sales technology vendors have joined the market over the last several years, and only about 10 have endured. "You want to place your bets carefully," White says.

Staff Writer Tom Field can be reached at tfield@cio.com.



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Edited by Elaine Cummings

Intranet Telephony

Will your LAN replace your PBX?

BY FRED HAPGOOD

FOR THE LAST SEVERAL DECADES, COMMUNICATIONS has existed in three separate universes: Voice has gone over reserved end-to-end circuits through telco switches, data has been delivered in packets over equipment maintained by IS staff and video has moved over the ether or half-duplex cable.

Futurists have long been prophesying a Great Integration, when all forms of communication would be defined by a single format, handled by the same equipment and possibly even billed for by the same company. The telephone industry made the first grab at that brass ring 15 years ago by defining the telecommunications standard known as ISDN, or integrated services digital network. (Wits say the acronym really stands for "It Still Does Nothing.") The plan was to bundle together voice, data and video and manage them all with the same telco equipment to extend the ongoing digitization of phone networks straight to the end user. However, ISDN apparently has not yet found its market (see "Getting a Line on ISDN," *WebMaster* magazine, September/October 1995).

PHOTO BY RALPH MERCER

Looking to the LAN

In 1993, packet-routing enthusiasts stepped forward. VocalTec Inc., an Israeli company with offices in Northvale, N.J., presented VocalChat, which enabled companies to move voice over local area networks. Users could install a card in their computers that, when connected with their handsets, checked whether the recipient of each call they made was connected to the company's LAN or WAN. If not, the call went to the company's in-house telephone switching system, or PBX (private branch exchange). But if the recipient was connected, the signal would be digitized, compressed, packetized and dropped onto the network. When the call got to the recipient's computer, the same kind of card there would decode and reassemble the voice and push it into the recipient's telephone system. VocalTec claimed the product would make it possible to add services such as dictation and capacity upgrades for less than the cost of using PBX technologies. Sales of VocalChat were discouraging. Jeff Pulver, author of an upcoming book on digital telephony, says the product worked but it was simply ahead of its time. "Companies are careful about introducing radical changes into such a critical application," he says.

IN THIS SECTION

Videoconferencing Update

Automated Mailing Lists

Rolodex Organization

Mobile Offices

So VocalTec regrouped, and in February 1995 it mounted a second attack on circuit switching with the Internet Phone, or IPhone—software that allowed interactive voice to run over the Internet. This time, the technology aimed to do more for the budget than cut costs of PBX upgrades: It looked to reduce the company's entire telephone bill. Since Internet access is typically much cheaper per unit of time than access to a telco circuit, a company could, in theory, save considerably by putting some or all of its calls over the Net, especially by using the device for international or other long-distance calls.

According to Pulver, while interest in the IPhone was

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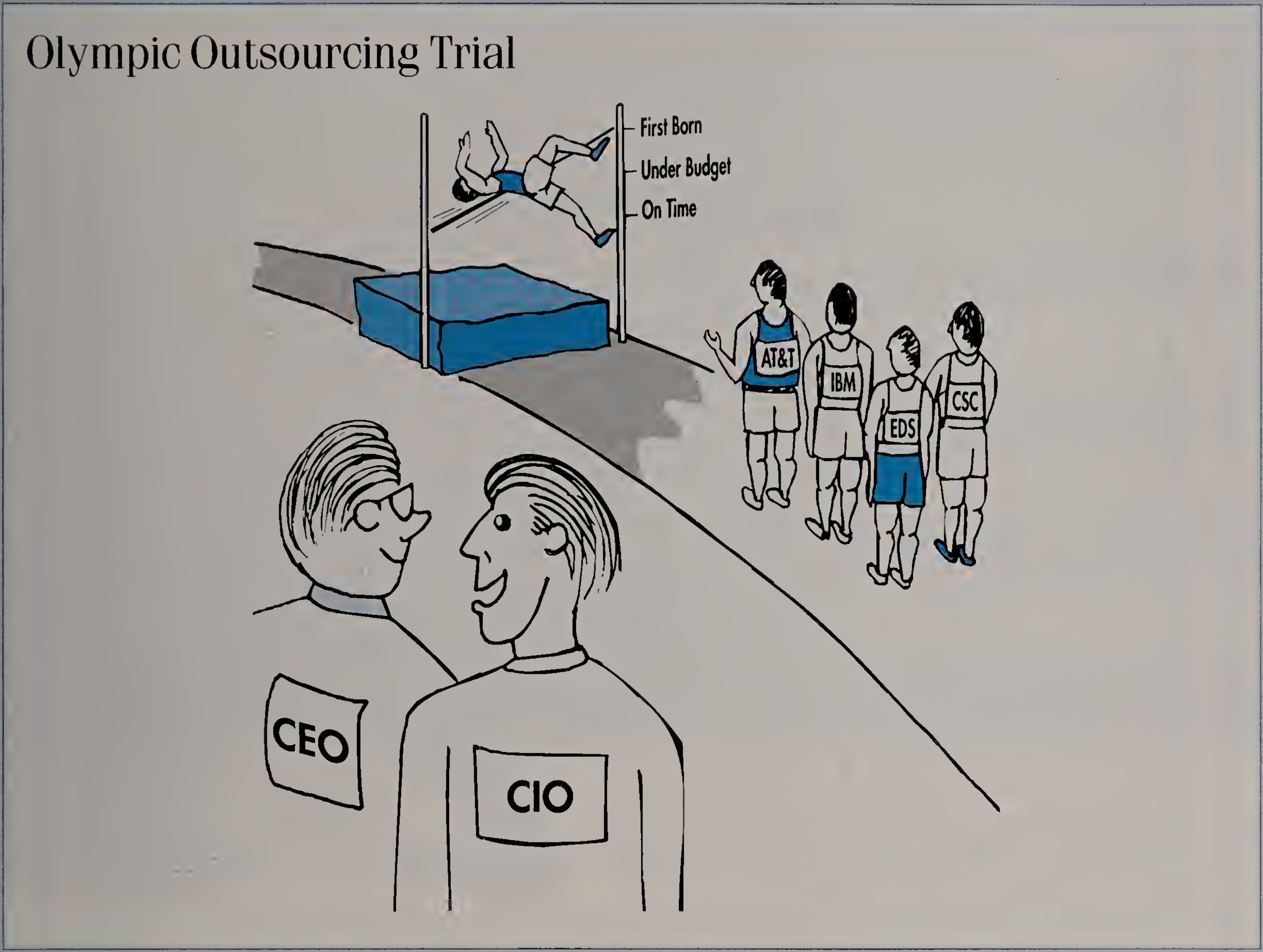

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strong among hobbyists and small groups of users (like family and friends calling circles), performance on such issues as call completion, response delay and voice quality was too uneven to make the program attractive to businesses. Some companies willing to deal with the quality issues did adopt the technology, however. Dennis Miniero, executive vice president of Radiant House Europe Ltd., a small import/export house in West Hempstead, N.Y., estimates that his company saves from $1,200 to $1,500 per month with the IPhone.

As confined as it was, interest in Internet telephony was strong enough that today more than two dozen companies, including those as central to the development of the Internet as Netscape, Microsoft and IBM, have announced products that support the technology.

Intranet Economies

But while 18 months of development have improved the technology significantly, service still is often no better than that of a cellular phone. Any of these programs would perform better over a LAN or WAN than over the Internet because most of the performance problems associated with packet-routed voice are caused by congestion, which is easier to control in local networks.

One incentive for exploring this "intranet telephony" option is economic: Besides the savings from feature and capacity upgrades, companies can save by placing intracorporate long-distance calls directly over the networks of privately leased lines used to connect corporate LANs, as opposed to making those calls through telco switches.

However, Pasha Roberts, president of Webline Communications, a startup in Belmont, Mass., says the primary benefit of intranet telephony lies less in cheap phone calls than in the broader economies and revenue growth in business operations possible with higher levels of voice and data integration. Webline is working on a product that will integrate a company's Web site, LAN and calling center or call distributor so that when a Web-browsing customer clicks on an item on a Web page, he or she will be connected to the sponsoring company

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VIDEOCONFERENCING VIA desktop PC is inching toward respectability. New codec standards allow equipment from different vendors to interoperate, and videoconferencing products are now available for virtually every kind of network.

DESKTOP VIDEOCONFERENCING

Alas, vendor enthusiasm is not always the mark of a mature technology. The current crop of products generally requires users to either shell out big bucks or take a hit in the quality of the video transmission. The cheapest possible solution is CU-SeeMe, a freeware product developed by Cornell University's Information Technology organization that runs videoconferences over the Internet. Commercial versions are in the works, but for now, the picture quality and lack of security make CU-SeeMe a dubious choice for corporate use.

Freeware aside, the least expensive products are typically plain, old telephone system (POTS) solutions, which work over standard telephone wiring. Intel Corp.'s Video Phone and Corel Corp.'s CorelVideo are significant improvements for POTS products, according to Patricia Borns, a senior analyst for middleware and conference solutions at Boston-based Aberdeen Group.

The drawback of POTS products is that their picture quality typically is poor. That can also be a problem with videoconferencing over the faster Ethernet lines usually found in corporate LANs. Video is a bandwidth hog; when video transmissions get into a shoving match with other network traffic, they raise concerns for the integrity of both. Several solutions are being researched. Router vendor Cisco Systems Inc. is working with other companies to support the Resource Reservation Protocol (RSVP), which guarantees a certain amount of pipeline for the videoconferencing data stream.

The next step is to use expensive, higher-bandwidth network technologies like ISDN or ATM. The good news here is that you might not have to pay an arm and a leg—one limb will probably suffice. For example, Wilmington, N.C.-based Target Technologies Inc.'s C-Phone costs a bit less than $2,000 per user, including a digital video camera, and lets up to 10 people use the same ISDN line.

Once videoconferencing moves out of the local loop to the WAN, performance problems can crop up. Desktop videoconferencing requires a lot of patience and fine-tuning, says Aberdeen's Borns. "[The quality] can be good in the LAN context, but in a WAN you can still see a lot of disconcerting delay in the picture," she says. That would give your next long-distance business meeting roughly the same flavor as a poorly dubbed foreign movie.

"TV-quality video is what people are used to," says Al Fross, president of The Pelorus Group in Raritan, N.J. The picture for desktop videoconferencing won't clear up completely until higher-bandwidth networks, such as asynchronous digital subscriber line become more common.

–Derek Slater

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through either Internet or telco telephony, whichever makes more sense for the customer. (If the customer wanted to use a telco circuit, he or she probably would have to dial the number.)

In either case, the call will go over the LAN to the first available sales rep. That rep will be able to accept a data feed from the customer, process it with data in the corporate databases and play the solutions through the company's Web page, where they will be picked up by the customer's browser and processed on his or her computer. Meanwhile, rep and customer could be conversing continuously during these data exchanges. Roberts thinks the day is not far off when business conversations will be accompanied routinely by real-time data presentations. Such versatile services will produce cost savings in every phase of the production cycle, from design to marketing.

One business that already has made a partial transition (perhaps ironically, given how often this technology is used to bypass telco pricing) is Bell Atlantic Corp. The regional Bell operating company, or RBOC, is using a Boston Technology Inc. platform to manage consumer voicemail (the service sold to retail customers) over its internal network. Messages left for subscribers are digitized and stored magnetically; when the subscriber calls in, the messages are retrieved and sent over a LAN to the port handling the subscriber's call, where an interface card translates the bytes into audio.

Cornell University's Information Technology organization (CIT) is on the verge of going even further—introducing an intranet telephony system that will displace PBX services substantially. "[Putting voice through the LAN] will save us significantly on upgrading the PBX, whether to meet increases in demand or to add features like autodialing, logging calls or point-and-click conference calling," says Bill Steele, technology editor of the *Cornell Chronicle*, a university publication. "We'll start with a prototype of about 200 stations later this year and then begin real deployment in maybe 1997." Dick Cogger, assistant director of advanced technology and planning for CIT, says without the project, the university's PBX would be supporting 20,000 lines by the end of the century. With it, he expects the load to shrink to 12,000 lines by that date and to keep decreasing from there.

Detour Ahead

From a cost perspective, the great advantage of packet routing is that it shares resources: Packets from many conversations travel in the same wire. Unfortunately, sharing resources also means packets are prone to trip over each other, creating losses and delays. Collisions and queues are not a prob-

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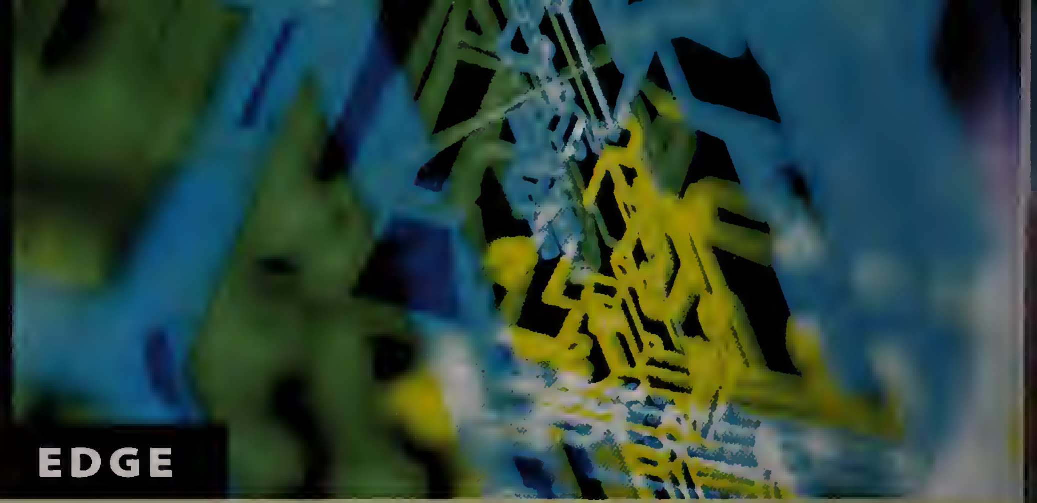
LEADING EDGE



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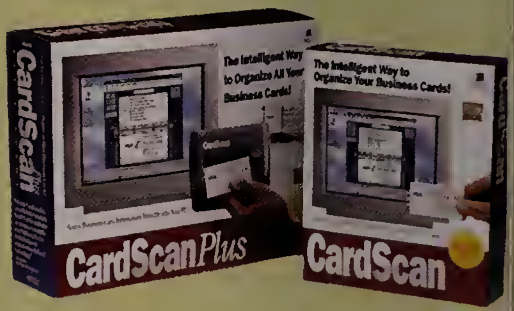
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lem for data traffic, which can sit and wait to be resent, but interactive voice is extremely time-sensitive. Even very small performance deficits during a voice conversation can lead to irritation and confusion.

Many of the Internet telephony programs address the problem of late or lost packets by averaging across the gaps; that is better than nothing, but it imposes costs on speech clarity—specifically, on phonemic contrast—and occasionally, when congestion gets intense, causes a loss of connection.

The Cornell system will address this problem by using a modified ATM (asynchronous transfer method) technology to give individual telephone conversations their own regions of reserved bandwidth, according to Scott Brim, Cornell's senior technical advisor. One feature likely to be of special interest to CIOs is the Cornell system's delivery of ATM-like functionality without requiring the purchase and installation of ATM cards in every machine on the college's LAN. In effect, the Cornell system, with its reserved bandwidth, bridges the difference at least partway between circuit-switched and packet-routed architectures. (Look for details at *cif.cornell.edu.*)

Although few corporations have made the jump to intranet telephony, many vendors are betting on a major increase in that market. In September, Micom Communications Corp. of Simi Valley, Calif., will introduce a Voice Over IP card that will support LAN/ WAN telephony, according to David Misunas, vice president for development. The product will deal with lost packets by adding information to each one so that when a packet is delayed, it can be recalculated from neighboring packets. This should be a more accurate technique than averaging. Misunas says the Micom card will be able to manage four phone trunks on a 56Kbps line while leaving at least half the bandwidth for conventional data traffic. A PBX would still be necessary to handle “off net” calls; although if a company has many PBXs connected to its WAN, the user can chase the lowest call costs by dialing out from the one nearest the intended recipient.

Although few corporations have made the jump to intranet telephony, many vendors are betting on a major increase in that market.

Dialogic Corp. of Parsippany, N.J., in cooperation with VocalTec, is working on a product that will dispense with even this last link to the old system. A person using the Internet Telephony Gateway to make a call from New York to Los Angeles could pick up any ordinary phone, call his corporate gateway and enter the city code and number of the call recipient. Gateway-N.Y. would call Gateway-L.A. using either the corporate WAN or the Internet and tell Gateway-L.A., which might or might not be owned by the same corporation, to dial the desired number into the local area. When the recipient in Los Angeles picked up the phone, the two gateways would digitize and packetize the conversation, which again might be carried over either a WAN or the Internet. One advantage of the technology is that it scales linearly, according to Larry Fromm, general manager of Gammalink, a related division of Dialogic. “PBX costs per port go up with size,” he says. “With this card, each new group of ports costs the same. Everything is off the shelf.”

Many observers reject the idea of polarizing intranet telephony between bad, old circuit switching and good, new packet routing. “People have been giving pretty short shrift to traditional telephony,” says Tony Tissot, director of systems marketing for Siemens Rolm in Santa Clara, Calif., but he points out that switching technology is built on standards of reliability and serviceability that significantly exceed those in data networks. As bad as its press has been (*The New York Times* recently said ISDN has “languished as an oddity”), the service is available now in most regions and provides full digitization, including voice, at the same levels of reliability as conventional phone service. Tissot suggests that circuit switching still has strong innings left on its card.

Fred Hapgood is a Boston-based technology writer. He can be reached at hapgood@pobox.com.

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ShopTalk

Colin Crook On the 21st-Century Enterprise

CIO: How far ahead do you plan IT strategies at Citicorp?
We look ahead three years, but we are taking a much more operational view of planning by rolling it forward. We're trying to change the notion of a series of static plans by using three-year plans to rationalize, converge and standardize our existing infrastructure. But we'd like to become much more real-time in our planning horizons.

IS executives today operate on what you've called "the edge of chaos." Any advice about how to live on the edge?
Put a premium on managing change as opposed to optimizing costs. At Citicorp, when we create a new process, we believe it is much more important to bring it rapidly up to stability and repeatability than to optimize it. We know things are bound to change.

You have spoken of the value of an adaptive, enabling infrastructure. What is its chief characteristic?
An infrastructure is not a utility; it is the core of a business. You don't consider your heart a "utility," do you? Well, you need the same sort of emotional bonding to an infrastructure. Citicorp's is based on large hardware complexes, which include mainframes and servers. We run big, global networks. We put a premium on global architecture, which is the framework for adaptation and change. For us, the network and the distributed infrastructure are critical.

We also work on convergence, which means we quickly eliminate the disparities in the infrastructure that add no value. As a result, the business units converge onto a much more finite set of applications, data and infrastructure. That is a massive challenge.

How are you tackling it?
It's been tough. First, the relationship between the business and the infrastructure had to change. In the past, the business would demand its own data centers, networks, data, applications and tools. So we ended up with massive complexity inside our infrastructure.

Now we invert the process and drive ruthlessly toward a core infrastructure that is standardized and aligned to the external world. When the external world changes, our internal infrastructure changes too. And the business units and users have to adapt to the infrastructure.

Second, we must become much more skilled at selecting the core technologies. Whoever is running the technology for a company has to understand the way the market is going.

That's a high-risk strategy for any CIO.
Sure. But the notion of the CIO has got to change. We see technology and business fusing. The CIO has to participate in that fusion. For example, I'm the chief technology officer and I'm also CIO. I work for and in partnership with Citicorp's chairman, John Reed, and with all of his key senior business executives. And I run the network infrastructure.

What does a new-style CIO do differently?
I am in the business of driving change. I am judged on my ability to introduce new thinking and, from a technology standpoint, to get this company organized for the 21st century as a global corporation. I've got to partner with the business units—to persuade, cajole and preach to them. And I've got to form a partnership with the chairman and his senior people. *–John Whitmarsh*

Spotlight On:

Colin Crook, *Senior technology officer and CIO, Citicorp, New York*

- **Bio** Was graduated in 1970 from England's City of Liverpool College of Technology. Became a top manager for Motorola. Joined Citicorp in 1991.
- **Day to Day** Establishes technology policy and standards, introduces new technology, evaluates the quality and direction of IS efforts and directs change throughout the corporation.
- **Challenges** With 8,000 IT employees and offices in 90 countries, will consolidate 25 data centers, 5,000 software developers, 100 disparate networks into Citicorp's Global Information Network.

PHOTO BY JOHN RAE

The Executive Resource for Doing Business on the Net

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1. Are you involved in management or development of World Wide Web utilization at your organization?

☐ Yes ☐ No

2. Which of the following best describes your title within your organization? *(Check one only)*

- ☐ 1. Webmaster
- ☐ 2. CEO, President, Owner, Partner, General Manager
- ☐ 3. CIO/VP of Information Systems/MIS/DP
- ☐ 4. Dir/Mgr of Information Systems/MIS/DP
- ☐ 5. VP/Dir/Mgr of Networking & Communications Systems
- ☐ 6. CFO/VP/Dir/Mgr Finance/Controller
- ☐ 7. Consultant
- ☐ 8. VP/Dir/Mgr Accounting
- ☐ 9. VP/Dir/Mgr Engineering/Manufacturing
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- ☐ 12. New Media Specialist
- ☐ 13. Content Producer/Developer/Editor
- ☐ 14. Systems Engineer/Programmer/Analyst
- ☐ 99. Other *(Please specify)* ____________

3. What is your primary job function within your organization? *(Check one only)*

Technical Management

- ☐ 1. Webmaster
- ☐ 2. IS management
- ☐ 3. Networking/LAN management
- ☐ 4. Communications management

Corporate Management

- ☐ 5. Executive management
- ☐ 6. Marketing management
- ☐ 7. Financial management
- ☐ 8. Engineering management
- ☐ 9. Sales management
- ☐ 10. Operations management
- ☐ 99. Other *(Please specify)* ____________

4. Which of the following best describes your organization's industry or function? *(Check one only)*

- ☐ 1. Manufacturer of Computers, Communication or Peripheral Equipment
- ☐ 2. Manufacturer of other products/processes not included above
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- ☐ 4. Finance: Insurance
- ☐ 5. Finance: Real Estate, Credit or Securities
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- ☐ 7. Government: Federal, State or Local
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- ☐ 9. Transportation: Land, Sea or Air
- ☐ 10. Education: College, University, Library, Secondary, Other
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- ☐ 12. Utility: Communications
- ☐ 13. Utility: Electric, Gas, Sanitation
- ☐ 14. Accounting or Legal Services
- ☐ 15. Online Product and Service Provider
- ☐ 16. Communications: Publishing, Broadcast, Advertising, Public Relations
- ☐ 17. VAR, VAD, Systems Integrator
- ☐ 18. Computer and Data Processing Services and Software
- ☐ 19. Business Services *(other than computer)*
- ☐ 20. Research and Development
- ☐ 21. Aerospace/Defense Contractor
- ☐ 22. Mining/Construction/Petroleum/Refining/Agriculture
- ☐ 99. Other *(Please specify)* ____________

5. What is the total number of employees: *(Check one only in each column)*

	A *In your entire org.*	B *At this location*
1. >5000	☐	1. ☐
2. 1001-5000	☐	2. ☐
3. 500-1000	☐	3. ☐
4. <500	☐	4. ☐

6. What are the total annual revenues of your entire organization? *(Check one only)*

- ☐ 1. Over $1 Billion
- ☐ 2. $501 Million to $1 Billion
- ☐ 3. $101 to $500 Million
- ☐ 4. $25 to $100 Million
- ☐ 5. Under $25 Million

7. Approximately how much will your organization spend in the next 12 months on computers, software, equipment and services for World Wide Web implementation? *(Check one only)*

- ☐ 1. More than $1,000,000
- ☐ 2. $500,000 to $999,999
- ☐ 3. $100,000 to $499,999
- ☐ 4. $25,000 to 99,999
- ☐ 5. Less than $25,000

8. In which ways are you/will you be involved in World Wide Web development at your organization? *(Check all that apply)*

- ☐ 1. Specify, recommend, or purchase products and services used in Web development
- ☐ 2. Develop Web content and applications
- ☐ 3. Strategic planning of Web projects
- ☐ 4. Manage the Web staff and activities
- ☐ 5. NONE OF THE ABOVE

9. Which of the following are currently in use or planned for use in your organization? *(Check all that apply)*

CLIENT OPERATING SYSTEMS

- ☐ 1. DOS
- ☐ 2. Macintosh
- ☐ 3. MVS
- ☐ 4. OS/2
- ☐ 5. OS/400
- ☐ 6. UNIX *(any variety)*
- ☐ 7. VM
- ☐ 8. VMS
- ☐ 9. VSE
- ☐ 10. Windows 3.X
- ☐ 11. Windows NT
- ☐ 12. Windows 95
- ☐ 13. Other *(Please specify)* ____________
- ☐ 99. NONE OF THE ABOVE

SERVER/NET OPERATING SYSTEMS

- ☐ 1. Apple
- ☐ 2. Banyan-Vines
- ☐ 3. IBM-LanServer
- ☐ 4. IBM-PC Lan
- ☐ 5. Microsoft-LanManager
- ☐ 6. Novell-NetWare
- ☐ 7. Windows NT
- ☐ 8. Other *(Please specify)* ____________
- ☐ 99. NONE OF THE ABOVE

PROTOCOLS

- ☐ 1. TCP/IP
- ☐ 2. OSI
- ☐ 3. SNA *(IBM)*
- ☐ 4. Appletalk
- ☐ 5. DECNet
- ☐ 6. IPX/SPX *(Novell)*
- ☐ 7. NetBIOS
- ☐ 8. X.25
- ☐ 9. NFS *(Sun)*
- ☐ 10. NetView
- ☐ 11. SNMP
- ☐ 12. Other *(Please specify)* ____________
- ☐ 99. NONE OF THE ABOVE

10. Which commercial Internet access providers do you currently use or plan to use in the next 12 months? *(Check all that apply)*

1. AOL	☐
2. AT&T	☐
3. BBN	☐
4. CompuServe	☐
5. GEIS	☐
6. IBM Global Network	☐
7. MCI	☐
8. Microsoft	☐
9. Netcom	☐
10. Prodigy	☐
11. PSI	☐
12. Sprint	☐
13. U B Networks	☐
14. UUNET	☐
15. Other *(Please specify)*	☐ ____________
99. NONE OF THE ABOVE	☐

(OVER, PLEASE ▶ ▶ ▶)

11. Please check below all the products and services that you help acquire, either through approval, planning, recommendation or specification.
(Check all that apply)

COMPUTERS/PERIPHERALS

☐ 1. Desktop PCs/Notebooks
☐ 2. PC Servers
☐ 3. Workstations
☐ 4. Unix Servers
☐ 5. RISC Servers
☐ 6. Monitors
☐ 7. Printers
☐ 8. Storage/Tape Drives
☐ 9. CD-ROM Drives
☐ 10. UPS

INTERNETWORKING/LANS

☐ 11. Local Area Networks
☐ 12. Network Operating Software (NOS)
☐ 13. LAN Servers
☐ 14. Bridges/Routers/Gateways
☐ 15. Intelligent Hubs/Hubs

WIDE AREA NETWORKING/INTERNET ACCESS

☐ 16. Modems
☐ 17. PCMCIA Modems
☐ 18. T-1/T-3 Multiplexers
☐ 19. T-1/T-3 Services
☐ 20. Fractional T-1 Services
☐ 21. Dedicated Lease Lines
☐ 22. 56 Kbps Services
☐ 23. ISDN Services

SOFTWARE

☐ 24. E-mail/Workgroup
☐ 25. Database Servers
☐ 26. PC Databases/Front End
☐ 27. Communications/Remote Access Software
☐ 28. Image/Document Management Software
☐ 29. Video conferencing
☐ 30. Multimedia

WEB SOFTWARE

☐ 31. Web Browsers
☐ 32. HTML Authoring Tools
☐ 33. VRML Authoring Tools
☐ 34. Web Publishing Tools
☐ 35. Search Tools/Engines
☐ 36. Encryption Software
☐ 37. Firewalls/Security
☐ 38. Transaction Processing
☐ 39. Consulting Services
☐ 40. Outsourcing
☐ 41. Other *(Please specify)* ________________

☐ 99. NONE OF THE ABOVE

12. Which of the following publications do you receive addressed to you personally?
(Check all that apply)

☐ 1. Interactive Week
☐ 2. Internet World
☐ 3. NetGuide
☐ 4. WebWeek
☐ 5. Wired

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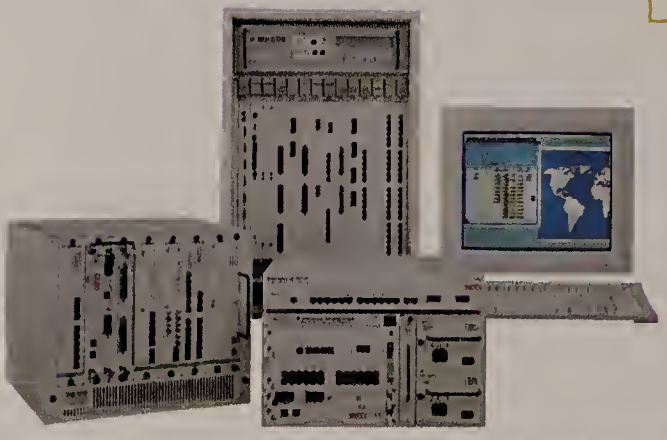

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